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ABSTRACT

This Unified Sciences and Mathematics for Elementary Schools (USMES) unit challenges students to find ways to help themselves and/or others adapt to new situations (including school and community facilities). The challenge is general enough to apply to many problem-solving situations in mathematics, science, social science, and language arts at any elementary school level (grades 1-8). The Teacher Resource Book for the unit is divided into five sections. Section I describes the USMES approach to student-initiated investigations of real problems, including a discussion of the nature of USMES "challenges." Section II provides an overview of possible student activities with comments on prerequisite skills, instructional strategies, suggestions when using the unit with primary grades, a flow chart illustrating how investigations evolve from students' discussions of orientation problems, and a hypothetical account of intermediate-level class activities. Section III provides documented events of actual class activities from grades 2/3, 4, 6, and 8. Section IV includes lists of "How To" cards and background papers, bibliography of non-USMES materials, and a glossary. Section V consists of charts identifying skills, concepts, processes, and areas of study learned as students become involved with orientation activities. (JN)

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USMES

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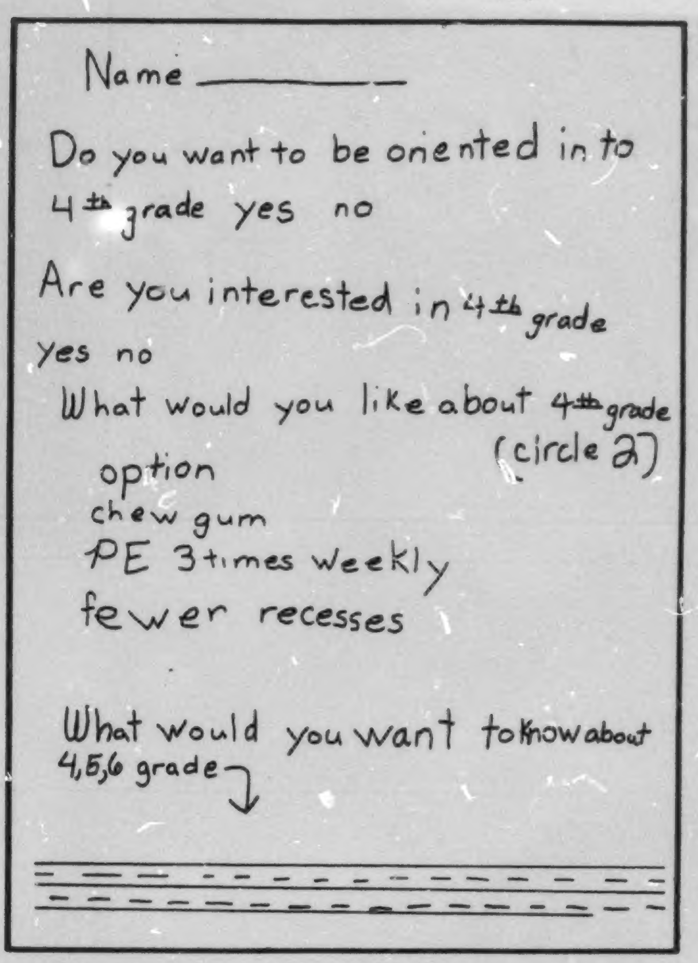


Name ______

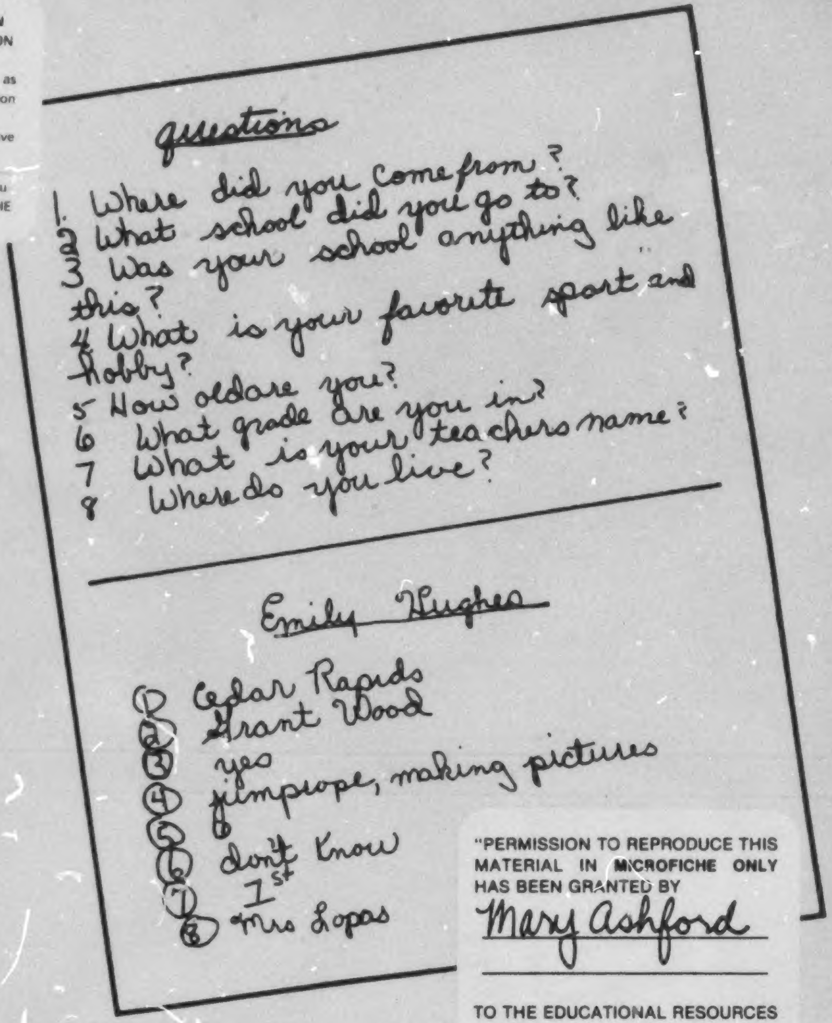
Do you want to be oriented in to 4th grade yes no

Are you interested in 4th grade yes no

What would you like about 4th grade (circle 2)

option
chew gum
PE 3 times weekly
fewer recesses

What would you want to know about 4,5,6 grade ↓



questions

1. Where did you come from?
2. What school did you go to?
3. Was your school anything like this?
4. What is your favorite sport and hobby?
5. How old are you?
6. What grade are you in?
7. What is your teachers name?
8. Where do you live?

Emily Hughes

① Cedar Rapids
② Grant Wood
③ yes
④ jumprope, making pictures
⑤ 6
⑥ don't know
⑦ 1st
⑧ Mrs Lopas

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Orientation

Teacher Resource Book

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This book is a resource developed by the USMES Project: Earle L. Lomon, Project Director; Betty M. Beck, Associate Director for Development; Thomas L. Brown, Associate Director for Utilization Studies; Quinton E. Baker, Associate Director for Administration.

UNIFIED SCIENCES AND MATHEMATICS FOR ELEMENTARY SCHOOLS:
Mathematics and the Natural, Social, and Communications Sciences in
Real Problem Solving.

Write-ups

Emily Hughes is 6 years old and in first grade. Her teachers. name is Mrs Lopas. She use to go to Grant Wood, and her school was like Horn. She likes to play jumprope and make pictures She use to live in Cedar Rapids

Orientation

Third Edition

Education Development Center, Inc.
55 Chapel Street
Newton, MA 02160

Trial Edition

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CHALLENGE: FIND WAYS TO HELP YOURSELVES AND/OR OTHERS TO ADAPT TO NEW SITUATIONS.

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Preface

The USMES Project

Unified Sciences and Mathematics for Elementary Schools: Mathematics and the Natural, Social, and Communications Sciences in Real Problem Solving (USMES) was formed in response to the recommendations of the 1967 Cambridge Conference on the Correlation of Science and Mathematics in the Schools.* Since its inception in 1970, USMES has been funded by the National Science Foundation to develop and carry out field trials of interdisciplinary units centered on long-range investigations of real and practical problems (or "challenges") taken from the local school/community environment. School planners can use these units to design a flexible curriculum for grades kindergarten through eight in which real problem solving plays an important role.

Development and field trials were carried out by teachers and students in the classroom with the assistance of university specialists at workshops and at occasional other meetings. The work was coordinated by a staff at the Education Development Center in Newton, Massachusetts. In addition, the staff at EDC coordinated implementation programs involving schools, districts, and colleges that are carrying out local USMES implementation programs for teachers and schools in their area.

Trial editions of the following units are currently available:

Advertising
Bicycle Transportation
Classroom Design
Classroom Management
Consumer Research
Describing People
Designing for Human Proportions
Design Lab Design
Eating in School
Getting There
Growing Plants
Manufacturing
Mass Communications
Nature Trails
Orientation
Pedestrian Crossings
Play Area Design and Use
Protecting Property
School Rules
School Supplies
School Zoo
Soft Drink Design
Traffic Flow
Using Free Time
Ways to Learn/Teach
Weather Predictions

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*See *Goals for the Correlation of Elementary Science and Mathematics*, Houghton Mifflin Co., Boston, 1969.

USMES Resources

In responding to a long-range challenge, the students and teachers often have need of a wide range of resources. In fact, all of the people and materials in the school and community are important resources for USMES activities. In addition USMES provides resources for both teachers and students. A complete set of all the written materials comprise the USMES library, which should be available in each school using USMES units. These materials include--

1. *The USMES Guide*: This book is a compilation of materials that may be used for long-range planning of a curriculum that incorporates the USMES program. It describes the USMES project, real problem solving, classroom strategies, the Design Lab, the units, and the support materials as well as ways that USMES helps students learn basic skills.

2. *Teacher Resource Books* (one for each challenge): Each of these guides to using USMES units describes a broad problem, explains how students might narrow that problem to fit their particular needs, recommends classroom strategies, presents edited logs from teachers whose classes have worked on the unit, and contains charts that indicate basic skills, processes, and areas of study that students may learn and utilize.

3. *Design Lab Manual*: This guide helps teachers and administrators set up, run, and use a Design Lab--a place with tools and materials in which the students can build things they need for their work on USMES. A Design Lab may be a corner of a classroom, a portable cart, or a separate room. Because many "hands-on" activities may take place in the classroom, every USMES teacher should have a Design Lab Manual.

4. *"How To" Series*: These student materials provide information to students about specific problems that may arise during USMES units. The regular *"How To" Series* covers problems in measuring, graphing, data handling, etc., and is available in two versions--a series of

cartoon-style booklets for primary grades and a series of magazine-style booklets with more reading matter for upper grades. The *Design Lab "How To" Series* is available in two illustrated card versions--one for primary grades and one for upper grades. A complete list of the *"How To" Series* can be found in the *USMES Guide*.

5. *Background Papers*: These papers, correlated with the *"How To" Series*, provide teachers with information and hints that do not appear in the student materials. A complete list can be found in the *USMES Guide*.

6. *Curriculum Correlation Guide*: By correlating the twenty-six USMES units with other curriculum materials, this book helps teachers to integrate USMES with other school activities and lessons.

The preceding materials are described in brief in the USMES brochure, which can be used by teachers and administrators to disseminate information about the program to the local community. A variety of other dissemination and implementation materials are also available for individuals and groups involved in local implementation programs. They include *Preparing People for USMES: An Implementation Resource Book*, the USMES slide/tape show, the Design Lab slide/tape show, the Design Lab brochure, videotapes of classroom activities, a general report on evaluation results, a map showing the locations of schools conducting local implementation of USMES, a list of experienced USMES teachers and university consultants, and newspaper and magazine articles.

* * * * *

Because Tri-Wall was the only readily available brand of three-layered cardboard at the time the project began, USMES has used it at workshops and in schools; consequently, references to Tri-Wall can be found throughout the Teacher Resource Books. The addresses of suppliers of three-layered cardboard can be found in the Design Lab Manual.

Introduction

Using the Teacher Resource Book

When teachers try a new curriculum for the first time, they need to understand the philosophy behind the curriculum. The USMES approach to student-initiated investigations of real problems is outlined in section A of this Teacher Resource Book.

Section B starts with a brief overview of possible student activities arising from the challenge; comments on prerequisite skills are included. Following that is a discussion of the classroom strategy for USMES real problem-solving activities, including introduction of the challenge, student activity, resources, and Design Lab use. Subsequent pages include a description of the use of the unit in primary grades, a flow chart and a composite log that indicate the range of possible student work, and a list of questions that the teacher may find useful for focusing the students' activities on the challenge.

Because students initiate all the activities in response to the challenge and because the work of one class may differ from that undertaken by other classes, teachers familiar with USMES need to read only sections A and B before introducing the challenge to students.

Section C of this book is the documentation section. These edited teachers' logs show the variety of ways in which students in different classes have worked at finding a solution to the challenge.

Section D contains a list of the titles of relevant sets of "How To" Cards and brief descriptions of the Background Papers pertaining to the unit. Also included in section D is a glossary of the terms used in the Teacher Resource Book and an annotated bibliography.

Section E contains charts that indicate the comparative strengths of the unit in terms of real problem solving, mathematics, science, social science, and language arts. It also contains a list of explicit examples of real problem solving and other subject area skills, processes, and areas of study learned and utilized in the unit. These charts and lists are based on documentation of activities that have taken place in USMES classes. Knowing ahead of time which basic skills and processes are likely to be utilized, teachers can postpone teaching that part of their regular program until later in the year. At that time students can study them in the usual way if they have not already learned them as part of their USMES activities.

A. Real Problem Solving and USMES

> *If life were of such a constant nature that there were only a few chores to do and they were done over and over in exactly the same way, the case for knowing how to solve problems would not be so compelling. All one would have to do would be to learn how to do the few jobs at the outset. From then on he could rely on memory and habit. Fortunately--or unfortunately depending upon one's point of view--life is not simple and unchanging. Rather it is changing so rapidly that about all we can predict is that things will be different in the future. In such a world the ability to adjust and to solve one's problems is of paramount importance.**

Real Problem Solving

USMES is based on the beliefs that real problem solving is an important skill to be learned and that many math, science, social science, and language arts skills may be learned more quickly and easily within the context of student investigations of real problems. Real problem solving, as exemplified by USMES, implies a style of education which involves students in investigating and solving real problems. It provides the bridge between the abstractions of the school curriculum and the world of the student. Each USMES unit presents a problem in the form of a challenge that is interesting to children because it is both real and practical. The problem is real in several respects: (1) the problem applies to some aspect of student life in the school or community, (2) a solution is needed and not presently known, at least for the particular case in question, (3) the students must consider the entire situation with all the accompanying variables and complexities, and (4) the problem is such that the work done by the students can lead to some improvement in the situation. This expectation of useful accomplishment provides the motivation for children to carry out the comprehensive investigations needed to find some solution to the challenge.

The level at which the children approach the problems, the investigations that they carry out, and the solutions that they devise may vary according to the age and ability of the children. However, real problem solving involves them, at some level, in all aspects of the problem-solving process: definition of the problem; determination of the important factors in the problem; observation; measurement; collection of data; analysis of the data using graphs, charts, statistics, or whatever means the students can find; discussion; formulation and trial of suggested solutions; clarification of values; decision making; and communications of findings to others. In addition, students become more inquisitive, more cooperative in working with others, more critical in their thinking, more self-reliant, and more interested in helping to improve social conditions.

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*Kenneth B. Henderson and Robert E. Pingry, "Problem-Solving in Mathematics," in *The Learning of Mathematics: Its Theory and Practice,* Twenty-first Yearbook of the National Council of Teachers of Mathematics (Washington, D.C.: The Council, 1953), p. 233.

The USMES Approach

To learn the process of real problem solving, the students must encounter, formulate, and find some solution to complete and realistic problems. The students themselves, not the teacher, must analyze the problem, choose the variables that should be investigated, search out the facts, and judge the correctness of their hypotheses and conclusions. In real problem-solving activities, the teacher acts as a coordinator and collaborator, not an authoritative answer-giver.

The problem is first reworded by students in specific terms that apply to their school or community, and the various aspects of the problem are discussed by the class. The students then suggest approaches to the problem and set priorities for the investigations they plan to carry out. A typical USMES class consists of several groups working on different aspects of the problem. As the groups report periodically to the class on their progress, new directions are identified and new task forces are formed as needed. Thus, work on an USMES challenge provides students with a "discovery-learning" or "action-oriented" experience.

Real problem solving does not rely solely on the discovery-learning concept. In the real world people have access to certain facts and techniques when they recognize the need for them. The same should be true in the classroom. When the students find that certain facts and skills are necessary for continuing their investigation, they learn willingly and quickly in a more directed way to acquire these facts and skills. Consequently, the students should have available different resources that they may use as they recognize the need for them, but they should still be left with a wide scope to explore their own ideas and methods.

Certain information on specific skills is provided by the sets of USMES "How To" Cards. The students are referred only to the set for which they have clearly identified a need and only when they are unable to proceed on their own. Each "How To" Cards title clearly indicates the skill involved--"How to Use a Stopwatch," "How to Make a Bar Graph Picture of Your Data," etc. (A complete list of the "How To" Cards can be found in Chapter IX of the USMES Guide.)

Another resource provided by USMES is the Design Lab or its classroom equivalent. The Design Lab provides a central location for tools and materials where devices may be constructed and tested without appreciably disrupting other classroom activities. Ideally, it is a separate room with space for all necessary supplies and equipment and work space for the children. However, it may be as small as a corner of the classroom and may contain only a few tools and supplies. Since the benefits of real problem solving can be obtained by the students only if they have a means to follow up their ideas, the availability of a Design Lab can be a very important asset.

Optimally, the operation of the school's Design Lab should be such as to make it available to the students whenever they need it. It should be as free as possible from set scheduling or programming. The students use the Design Lab to try out their own ideas and/or to design, construct, test, and improve many devices initiated by their responses to the USMES challenges. While this optimum operation of the Design Lab may not always be possible due to various limitations, "hands-on" activities may take place in the classroom even though a Design Lab may not be available. (A detailed discussion of the Design Lab can be found in Chapter VI of the USMES Guide, while a complete list of "How To" Cards covering such Design Lab skills as sawing, gluing, nailing, soldering, is contained in Chapter IX.)

Work on all USMES challenges is not only sufficiently complex to require the collaboration of the whole class but also diverse enough to enable each student to contribute according to his/her interest and ability. However, it should be noted that if fewer than ten to twelve students from the class are carrying out the investigation of a unit challenge, the extent of their discovery and learning can be expected to be less than if more members of the class are involved. While it is possible for a class to work on two related units at the same time, in many classes the students progress better with just one.

The amount of time spent each week working on an USMES challenge is crucial to a successful resolution of the problem. Each challenge is designed so that the various investigations will take from thirty to forty-five hours, depending on the age of the children, before some solution to the problem is found and some action is taken on the results of the investigations. Unless sessions are held at least two or three times a week, it is difficult for the children to maintain their interest and momentum and to become involved intensively with the challenge. The length of each session depends upon the age level of the children and the nature of the challenge. For example, children in the primary grades may proceed better by working on the challenge more frequently for shorter periods of time, perhaps fifteen to twenty minutes, while older children may proceed better by working less frequently for much longer periods of time.

Student interest and the overall accomplishments of the class in finding and implementing solutions to the challenge indicate when the class's general participation in unit activities should end. (Premature discontinuance of work on a specific challenge is often due more to waning interest on the part of the teacher than to that of the students.) However, some students may continue work on a voluntary basis on one problem, while the others begin to identify possible approaches to another USMES challenge.

Importance of the Challenge

Although individual (or group) discovery and student initiation of investigations is the process in USMES units, this does not imply the constant encouragement of random activity. Random activity has an important place in children's learning, and opportunities for it should be made available at various times. During USMES activities, however, it is believed that children learn to solve real problems only when their efforts are focused on finding some solution to the real and practical problem presented in the USMES challenge. It has been found that students are motivated to overcome many difficulties and frustrations in their efforts to achieve the goal of effecting some change or at least of providing some useful information to others. Because the children's commitment to finding a solution to the challenge is one of the keys to successful USMES work, it is extremely important that the challenge be introduced so that it is accepted by the class as an important problem to which they are willing to devote a considerable amount of time.

The challenge not only motivates the children by stating the problem but also provides them with a criterion for judging their results. This criterion—if it works, it's right (or if it helps us find an answer to our problem, it's a good thing to do)--gives the children's ideas and results a meaning within the context of their goal. Many teachers have found this concept to be a valuable strategy that not only allows the teacher to respond positively to all of the children's ideas but also helps the children themselves to judge the value of their efforts.

Role of the Teacher

With all of the above in mind, it can be said that the teacher's responsibility in the USMES strategy for open classroom activities is as follows:

1. Introduce the challenge in a meaningful way that not only allows the children to relate it to their particular situation but also opens up various avenues of approach.

2. Act as a coordinator and collaborator. Assist, not direct, individuals or groups of students as they investigate different aspects of the problem.

3. Hold USMES sessions at least two or three times a week so that the children have a chance to become involved in the challenge and carry out comprehensive investigations.

4. Provide the tools and supplies necessary for initial hands-on work in the classroom or make arrangements for the children to work in the Design Lab.

5. Be patient in letting the children make their own mistakes and find their own way. Offer assistance or point out sources of help for specific information (such as the "How To" Cards) only when the children become frustrated in their approach to the problem. Conduct skill sessions as necessary.

6. Provide frequent opportunities for group reports and student exchanges of ideas in class discussions. In most cases, students will, by their own critical examination of the procedures they have used, improve or set new directions in their investigations.

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7. If necessary, ask appropriate questions to stimulate the students' thinking so that they will make more extensive and comprehensive investigations or analyses of their data.

8. Make sure that a sufficient number of students (usually ten to twelve) are working on the challenge so that activities do not become fragmented or stall.

Student success in USMES unit activities is indicated by the progress they make in finding some solution to the challenge, not by following a particular line of investigation nor by obtaining specified results. The teacher's role in the USMES strategy is to provide a classroom atmosphere in which all students can, in their own way, search out some solution to the challenge.

USMES in the Total School Program

Today many leading educators feel that real problem solving (under different names) is an important skill to be learned. In this mode of learning particular emphasis is placed on developing skills to deal with real problems rather than the skills needed to obtain "correct" answers to contrived problems. Because of this and because of the interdisciplinary nature of both the problems and the resultant investigations, USMES is ideal for use as an important part of the elementary school program. Much of the time normally spent in the class on the traditional approaches to math, science, social science, and language arts skills can be safely assigned to USMES activities. In fact, as much as one-fourth to one-third of the total school program might be allotted to work on USMES challenges. Teachers who have worked with USMES for several years have each succeeding year successfully assigned to USMES activities the learning of a greater number of traditional skills. In addition, reports have indicated that students retain for a long time the skills and concepts learned and practiced during USMES activities. Therefore, the time normally spent in reinforcing required skills can be greatly reduced if these skills are learned and practiced in the context of real problem solving.

Because real problem-solving activities cannot possibly cover all the skills and concepts in the major subject areas, other curricula as well as other learning modes (such as "lecture method," "individual study topics," or programmed instruction) need to be used in conjunction with USMES in an optimal education program. However, the other instruction will be enhanced by the skills, motivation, and understanding provided by real problem solving, and, in some cases, work on an USMES challenge provides the context within which the skills and concepts of the major subject areas find application.

In order for real problem solving taught by USMES to have an optimal value in the school program, class time should be apportioned with reason and forethought, and the sequence of challenges investigated by students during their years in elementary school should involve them in a variety of skills and processes. Because all activities are initiated by students in response to the challenge, it is impossible to state unequivocally which activities will take place. However, it is possible to use the documentation of activities that have taken place in USMES trial classes to schedule instruction on the specific skills and processes required by the school system. Teachers can postpone the traditional way of teaching the skills that might come up in work on an USMES challenge until later in the year. At that time students can learn the required skills in the usual way if they have not already learned them during their USMES activities.

These basic skills, processes, and areas of study are listed in charts and lists contained in each Teacher Resource Book. A teacher can use these charts to decide on an overall allocation of class time between USMES and traditional learning in the major subject disciplines. Examples of individual skills and processes are also given so that the teacher can see beforehand which skills a student may encounter during the course of his investigations. These charts and lists may be found in section E.

Ways In Which USMES Differs From Other Curricula

As the foregoing indicates, USMES differs significantly from other curricula. Real problem solving develops the problem-solving ability of students and does it in a way (learning-by-doing) that leads to a full understanding of the process. Because of the following differences, some teacher preparation is necessary. Some teachers may have been introduced by other projects to several of the following new developments in education, but few teachers have integrated all of them into the new style of teaching and learning that real problem solving involves.

1. New Area of Learning—Real problem solving is a new area of learning, not just a new approach or a new content within an already-defined subject area. Although many subject-matter curricula

include something called problem solving, much of this problem solving involves contrived problems or fragments of a whole situation and does not require the cognitive skills needed for the investigation of real and practical problems. Learning the cognitive strategy required for real problem solving is different from other kinds of learning.

3. Interdisciplinary Education--Real problem solving integrates the disciplines in a natural way; there is no need to impose a multi-disciplinary structure. Solving real and practical problems requires the application of skills, concepts, and processes from many disciplines. The number and range of disciplines are unrestricted and the importance of each is demonstrated in working toward the solution of practical problems.

3. Student Planning--To learn the process of problem solving, the students themselves, not the teacher, must analyze the problem, choose the variables that should be investigated, search out the facts, and judge the correctness of the hypotheses and conclusions. In real problem-solving activities the teacher acts as a coordinator and collaborator, not as an authoritative source of answers.

4. Learning-by-Doing--Learning-by-doing, or discovery learning as it is sometimes called, comes about naturally in real problem solving since the problems tackled by each class have unique aspects; for example, different lunchrooms or pedestrian crossings have different problems associated with them and, consequently, unique solutions. The challenge, as defined in each situation, provides the focus for the children's hands-on learning experiences, such as collecting real data; constructing measuring instruments, scale models, test equipment, etc.; trying their suggested improvements; and (in some units) preparing reports and presentations of their findings for the proper authorities.

5. Learning Skills and Concepts as Needed--Skills and concepts are learned in real problem solving

as the need for them arises in the context of the work being done, rather than having a situation imposed by the teacher or the textbook being used. Teachers may direct this learning when the need for it arises, or students may search out information themselves from resources provided.

6. Group Work--Progress toward a solution to a real problem usually requires the efforts of groups of students, not just individual students working alone. Although some work may be done individually, the total group effort provides good opportunities for division of labor and exchange of ideas among the groups and individuals. The grouping is flexible and changes in order to meet the needs of the different stages of investigation.

7. Student Choice--Real problem solving offers classes the opportunity to work on problems that are real to them, not just to the adults who prepare the curriculum. In addition, students may choose to investigate particular aspects of the problem according to their interest. The variety of activities ensuing from the challenge allows each student to make some contribution towards the solution of the problem according to his or her ability and to learn specific skills at a time when he or she is ready for that particular intellectual structure.

B. General Papers on Orientation

1. OVERVIEW OF ACTIVITIES

Challenge:

Find ways to help yourselves and/or others to adapt to new situations.

Possible Class Challenges:

Find ways to help new students and/or parents adapt to the school.

Find ways to help new students and/or their families adapt to the community (recreational, cultural, educational facilities).

There are many different orientation situations that might be real problems to children. If the class is going to move to a new school at the end of the year, finding out about the new school may be a real problem to them. If they have just moved to a new school, they may identify with next year's incoming grade and want to help orient them. They may also wish to help new students moving to the area. Some other situations that might lead to problems which can be investigated by a class are (1) starting to use the school bus, (2) changing grades, (3) orienting new students and their families to the community, or (4) the arrival of a new teacher. Once students have realized that a problem of orientation exists, either for themselves or for others in the school and/or community, the children may decide to work in small groups on different aspects of the problem. The flow chart suggests some activities that might take place in the class.

The class may wish to survey other students for their opinions on the problem and its possible solutions. The tallying and graphing of their data will help them decide what action should be taken and what other data they need to collect.

The children may decide that several different courses of action should be taken and different groups may work on different solutions to the problem. These may take the form of an informational package or program, such as booklets, slide/tape shows, films, posters, directories, maps, etc. Students will have to decide what the best medium is for communicating the information they will use. In some situations the course of action may entail the formulation and trial of rules of behavior.

The class may then work on collecting material and information and have class discussions to evaluate the content and quality of each group's contribution. When the orientation programs are used, students may wish to collect data and test whether the orientation was successful.

Follow-up activities may arise naturally as investigations of the Orientation challenge end. Students might want to advertise an orientation meeting to be held for new students and thus become involved in the Advertising unit. A slide presentation or a handbook developed by the class might be deemed worthwhile for schoolmates to have--a perfect introduction to the Manufacturing unit.

Although many of the activities in the Orientation unit may require skills and concepts new to the children, there is no need for preliminary work on these skills and concepts because the children can learn them when the need arises. In fact, children learn more quickly and easily when they see a need to learn. Consider counting: whereas children usually learn to count by rote, they can, through USMES, gain a better understanding of counting by learning or practicing it within real contexts. In working on Orientation, children also learn and practice graphing, measuring, working with decimals, and dividing. Although dividing seems necessary to compare fractions or ratios, primary children can make comparisons graphically; sets of data can also be compared graphically or by subtracting medians (half-way values). Furthermore, instead of using division to make scale drawings, younger children can convert their measurements to spaces on graph paper. Division may be introduced during calculation of percentages, averages, or unit costs.

2. CLASSROOM STRATEGY FOR ORIENTATION

The Orientation unit centers on a challenge--a statement that says, "Solve this problem." Its success or failure in a classroom depends largely on (1) the relevance of the problem for the students and (2) the process by which they define and accept the challenge. If the children see the problem as a real one, they will be committed to finding a solution; they will have a focus and a purpose for their activities. If the students do not think the problem affects them, their attempts at finding solutions will likely be disjointed and cursory.

The Orientation challenge--"Find ways to help yourselves and/or others to adapt to new situations"--is general enough to apply to many situations. Students in different classes define and reword the challenge to fit their particular situation and thus arrive at a specific class challenge. For example, one class restated the challenge in terms of finding ways to tell new students and their parents about the school and its program.

The Process of Introducing the Challenge

Given that an Orientation problem exists, how can a teacher, without being directive, help the students identify the challenge that they will work on as a group? There is no set method because of variations among teachers, classes and schools. However, USMES teachers have found that certain general techniques are helpful in introducing the Orientation challenge.

One such technique is to make use of a spontaneous discussion of a recent event relating to the challenge, such as when a new student enters the class and knows nothing about the school or when the class has a visitor who knows nothing about the school.

> *A sixth-grade social studies class began their investigations of the Orientation challenge soon after two new students were introduced to the rest of the class. Children informally discussed the problems encountered when one moves to a new school, city, state, or country. The group shared their personal experiences and then summarized the main problems of such a move in a list which was written on the board. The class's next USMES session focused on the problem of adjusting to a new school. Once the problems were identified and possible solutions were suggested, the class grouped to investigate areas of their choice.*

Often, work on one challenge leads to another. For example, the Orientation challenge may arise from work on the Getting There or School Rules challenges. When children encounter a problem that leads to a related Orientation challenge, one group of children may begin work on this second challenge while the rest of the class continues with the first challenge. However, there should be at least ten to twelve students working on any one challenge; otherwise, the children's work may be fragmented or superficial or may break down completely.

An Orientation challenge may also arise from a discussion of a current social issue, such as busing. Students may wish to find ways to help students bused to their school from other neighborhoods to adapt to their new environment.

Sometimes the discussion of a broad problem may encompass the challenges of several related units. For example, a discussion of problems during the first days of school may lead to Orientation, Getting There, Classroom Management, or School Rules. An experienced USMES teacher is usually willing to have the children work on any one of the several challenges that may arise during the discussion of a broad problem. While this approach gives the children the opportunity to select the challenge they are most interested in investigating, it does place on the teacher the additional responsibility of being prepared to act as a resource person for whichever challenge is chosen.

Classroom experience has shown that children's progress on the Orientation challenge may be poor if the teacher and students do not reach a common understanding of what the challenge is before beginning work on it. Having no shared focus for their work, the children will lack the motivation inherent in working together to solve a real problem. As a result, they may quickly lose interest.

A kindergarten class had trouble getting started on a challenge of how to get to know more about their school because this challenge was presented to them by the teacher without any discussions on the subject. Most of the students were quite slow in recognizing the need for finding out more about the school. While the class did decide to visit the school office and cafeteria to talk to personnel and find out what they did, it was not until several months later, after repeated attempts by the teacher to arouse interest in the challenge, that the students decided to focus their challenge on finding out about what went on in first-grade classes. This narrower challenge was easier for them to deal with because they were genuinely interested in what their experiences in school would be during the next year.

Initial Work on the Challenge

Once a class has decided to work on an Orientation challenge, USMES sessions should be held several times a week, but they need not be rigidly scheduled. When sessions are held after long intervals, students often have difficulty remembering exactly where they were in their investigations and their momentum diminishes.

When students begin work on their challenge, they list aspects of the problem that they wish to investigate. This procedure is combined with or followed by preliminary observations and/or opinion surveys to identify features of the problem that other people feel are critical.

> *To begin work on a challenge of helping new students adjust to the school, a sixth-grade class listed the difficulties that new students might have: (1) finding their way around the building, (2) learning new rules, schedules, and procedures, (3) meeting teachers and classmates, and (4) dealing with new ways of learning, teaching, and grading. Some students then visited classes to observe general classroom setups while others prepared survey questions to determine which of these difficulties new students most often encountered.*

Next, the students usually categorize their suggested approaches, grouping similar ideas together. Often a class divides into groups to attack the different aspects of the problem. It is important that the class set priorities for the tasks they consider necessary so that some groups do not become stalled in their progress because others have not completed their work.

> *One eighth-grade class decided to develop a combination of ways to solve their problem. They divided into groups to work on a slide/tape show, write-ups about new students, school booklets, and meetings with new students, their parents, and their teachers.*

As various groups complete their work, their members join other groups or form new groups to work on additional tasks. However, if too many groups are formed, work on the challenge can become fragmented. The teacher finds it impossible to be aware of the progress and problems of each group; in addition, the small number of students in each group lessens the chance for varied input and interaction.

Refocusing on the Challenge

As a class works on an Orientation challenge, the children's attention should, from time to time, be refocused on that challenge so that they do not lose sight of their overall goal. Refocusing is particularly important with younger children because they have a shorter attention span. Teachers find it helpful to hold periodic class discussions that include group reports. Such sessions help the students review what they have accomplished and what they still need to do in order to find some solutions to the problem. These discussions also provide an opportunity for students to participate both in evaluating their own work and in exchanging ideas with their classmates. (Another consequence of having too many groups is that not every group can be given enough time to report to the class, thereby increasing the possibility that the children's efforts will overlap unnecessarily.)

The kindergarten teacher found that the class needed to be reminded constantly of what their challenge was. Their short attention span seemed to be lengthened and their interest increased when she asked them specific questions to encourage them toward a solution of their problem. For example, to the question of how they would find out what they wanted to know about first grade, the children suggested talking to first graders and to first-grade teachers and visiting first-grade classes. Eventually they visited some of the first-grade classrooms and later arranged for one of the first-grade teachers to come to their class and speak to them about some of the activities they could expect in first grade.

Resources for Work on the Challenge

When children try to decide on solutions before collecting and analyzing enough data or encounter difficulties during their investigations, an USMES teacher helps out. Instead of giving answers or suggesting specific procedures, the teacher asks open-ended questions that stimulate the students to think more comprehensively and creatively about their work. For example, instead of telling students that they need to survey other students to find out what information they may want, the teacher might ask, "How can you find out what other students want to know?" Examples of other nondirective, thought-provoking questions are given in section B6.

The teacher may also refer students to the "How To" Cards, which provide information about specific skills, such as using a stopwatch or drawing graphs. If many students, or even the entire class, need help in particular areas, such as using fractions, the teacher should conduct skill sessions as these needs arise. (Background Papers provide teachers with additional information on specific problems associated with some challenges and on general topics applicable to most challenges.)

USMES teachers can also assist students by making it possible for them to carry out tasks involving hands-on activities. If children need to collect data outside of their classroom--at another school, on the playground, in other parts of the school, or in other classrooms--the teacher can help with scheduling and supervision. If the children want to design and construct signs or other items, the teacher should make sure that they have access to a Design Lab--any collection of tools and materials kept in a central location (in part of the classroom, on a portable cart, or in a separate room). (See section A for further details about the Design Lab.)

Valuable as it is, a Design Lab is not necessary to begin work on an USMES challenge. The Design Lab is used only when needed, and this need may not arise during early work on the challenge. To carry out construction activities in schools without Design Labs, students may scrounge or borrow tools and supplies from parents, local businesses, or other members of the community.

One eighth-grade class responded successfully to the Orientation challenge without using the Design Lab. They started by discussing the problems faced by newcomers and divided into groups to investigate different aspects. One group produced a school handbook, another made a slide/tape show, and a third group made a scale map of the school.

One fourth-grade class worked successfully on the Orientation unit without using a Design Lab. The class made and decorated large Tri-Wall posters to which they attached various letters, pictures, and *drawings of their new school. These posters were then set up as a display area for parents during a parent-teacher conference day.*

The extent to which any Design Lab is used varies with different classes and different units because the children themselves determine the direction of the investigations.

Culminating Activities

Student investigations generally continue until the children have agreed upon and implemented some solution to the problem. Classes focusing on the problems of new students and the school may choose to arrange a "buddy" system, prepare a slide/tape show about the school facility and school program, and/or hold an orientation meeting for new students and their parents early in the semester. Students investigating ways to orient new students and their families to the community may form a "Welcome Wagon" Committee to visit the homes of new students or prepare a booklet to describe recreational, educational, and cultural facilities in the community.

One second/third-grade class organized a program to orient themselves and the other primary class to the intermediate unit. The program consisted of slides of the intermediate unit, posters showing drawings of the intermediate classrooms, an explanation of the curriculum obtained by interviewing teachers, and a question-and-answer period. After the program had been presented, the students arranged tours of the intermediate unit for members of their class. All of them felt that their efforts had been successful and they were no longer apprehensive about entering the intermediate unit.

Students in one sixth-grade class developed a slide/tape presentation, an informational booklet about the school, and a booklet of information on new students to help new students and other people unfamiliar with the school. They also organized an orientation meeting for new students and their parents.

3. USE OF ORIENTATION IN THE PRIMARY GRADES

Children in the primary grades may become very involved in the Orientation unit while working on a class challenge of finding ways to help themselves or others adapt to a new situation. Although their entry level to the challenge and their sophistication with the investigation will certainly be different from that of intermediate grade children, they will be able to propose possible solutions, collect and interpret data, and take effective action to meet their challenge. A change in grade level or questions about available community resources may be the basis for a lively discussion in response to the teacher's questions, "Do you ever wonder about next year in school?" or "Do you know what places there are in the community for us to use?"

Students in one kindergarten class became interested in finding out what to expect in first grade. Their activities included making maps of the kindergarten and first-grade halls and getting to the first-grade hall, visiting and talking to some first graders and first-grade teachers about what they did in school, and inviting one of the first-grade teachers to come to their class and speak to them about a typical day in first grade. Once they knew something about first grade, they began to look forward enthusiastically to the next year.

Class discussions of how the children feel about entering the intermediate grades provide a forum for the children to voice their concerns and anxieties about the new situation they face. A positive response from students to a question about whether knowing about something makes it easier, more enjoyable, and less frightening leads naturally to the class challenge, "Let's find ways to help ourselves and other students in our grade level adapt to the intermediate grades."

In order to get a complete list of the concerns of their peers, some classes decide to develop and administer a survey to other classes before deciding what to do. Other classes may decide to confine the survey to their own class. A trial within the classroom will quickly show that survey questions should be clear and concise in order to obtain the desired information. The trial will also show that the number of questions should be kept to a minimum because of the time consumed in tallying the results. The children might also decide to survey a sample of students rather than the whole student body.

Once the data have been collected, the children will have to put it in a form that can be interpreted; data representation can take the form of simple graphs or charts, the preparation of which is an effective mathematics experience.

In other classes several groups may form to develop various aspects of an orientation program. Teachers in some primary classes work with the whole class on one aspect of the problem at a time. The children may be interested in preparing a student directory of names, addresses, and phone numbers of all students scheduled to be in the intermediate grades the following year. This can be accomplished in any number of ways, such as (1) getting the information directly from the students or (2) using lists already prepared by the school office. Several of the interested students may begin to collect data on the costs of various printing methods. They may present their data to their classmates during a full class discussion and decide together the cost per book of various methods by making a slope diagram. With the costs calculated, the children make a decision on how to reproduce their booklets.

The children may also deem it extremely important to prepare maps of the intermediate classrooms and special facilities. The children might use graph paper and convert their measurements to "blocks" on the paper to accomplish this. This process would involve measuring and offer the chance for the acquisition of new skills or the practice of old ones. Class and group discussions may help them realize that only permanent parts of the room, such as walls, doors, and windows, should be included since the furniture could be arranged differently the following year. These tasks are made easier by the fact that the children have a reason to do them. The class might also decide to make a simple presentation of some of the curriculum activities in which they would be involved. The presentation would be based on their observations of activities, survey information, and interviews with intermediate students and teachers.

The children might eventually follow up an earlier idea of conducting tours for other students of the intermediate area. Students would determine areas of interest and numbers of students interested, plan the tours, and acquire the permission of the teachers involved. Once the tour is mapped out, trial runs might be timed to help students formulate a schedule for the tours. They might base their schedule on the median of the trial times--medians can be determined easily by children in the primary grades.

As these activities continue, frequent class discussions are held in which groups report to the class, decisions are made, and students help each other with problems that develop. Questions (as needed) from the teacher serve as a continuing focus on the problem and as a way of judging which, if any, new skills are needed. The children might decide to evaluate the effectiveness of their efforts after their orientation program is complete. This may be accomplished through discussions or surveys.

The USMES goal of imparting to children the power of using concrete investigations as the basis for decision making can be realized in the primary grades. In addition, the interdisciplinary nature and the development of interpersonal relations in USMES activities is especially helpful in the development of the "whole" child. At an early age children see the interrelationship among language arts, mathematics, science, and social science. After working on this specific unit, the children may face other new situations with a reduced level of apprehension.

4. FLOW CHART

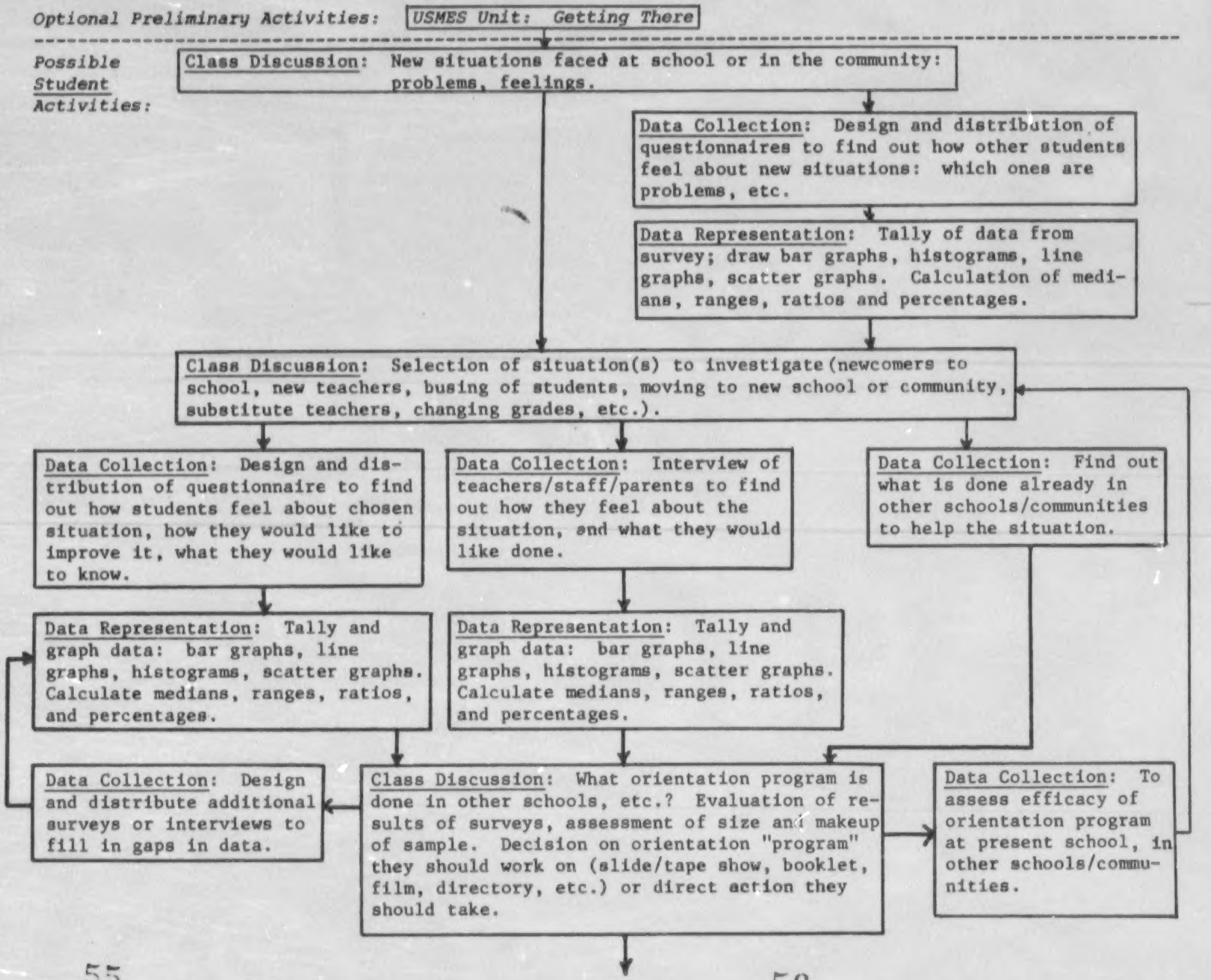
The following flow chart presents some of the student activities—discussions, observations, calculations, constructions—that may occur during work on an Orientation challenge. Because each class will choose its own approach to the challenge, the sequences of events given here represent only a few of the many possible variations. Furthermore, no one class is expected to undertake all the activities listed.

The flow chart is not a lesson plan and should not be used as one. Instead, it illustrates how comprehensive investigations evolve from the students' discussion of an Orientation problem.

Challenge: Find ways to help yourselves and/or others adapt to new situations.

Optional Preliminary Activities: *USMES Unit: Getting There*

Possible Student Activities:



Class Discussion: New situations faced at school or in the community: problems, feelings.

Data Collection: Design and distribution of questionnaires to find out how other students feel about new situations: which ones are problems, etc.

Data Representation: Tally of data from survey; draw bar graphs, histograms, line graphs, scatter graphs. Calculation of medians, ranges, ratios and percentages.

Class Discussion: Selection of situation(s) to investigate (newcomers to school, new teachers, busing of students, moving to new school or community, substitute teachers, changing grades, etc.).

Data Collection: Design and distribution of questionnaire to find out how students feel about chosen situation, how they would like to improve it, what they would like to know.

Data Collection: Interview of teachers/staff/parents to find out how they feel about the situation, and what they would like done.

Data Collection: Find out what is done already in other schools/communities to help the situation.

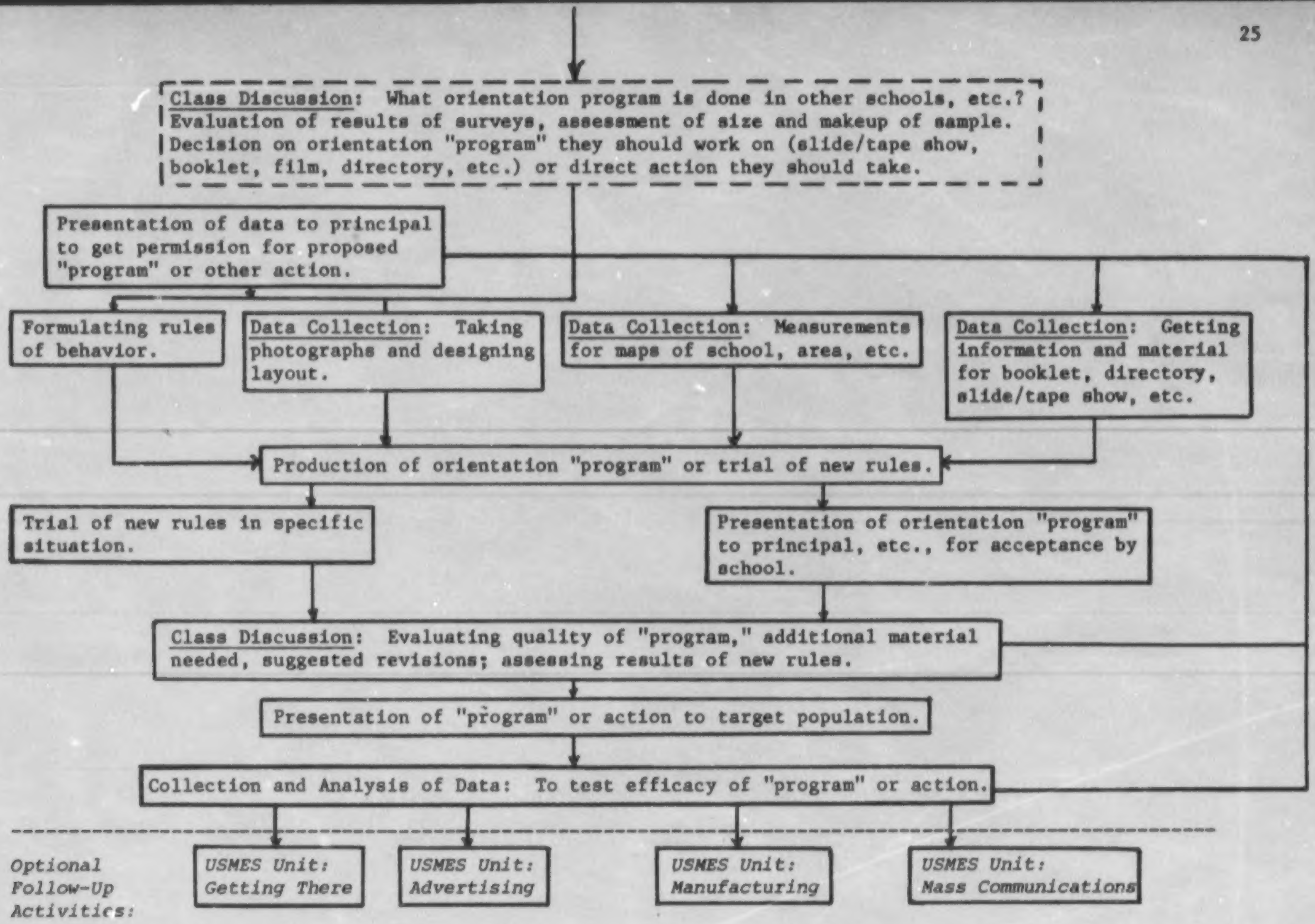
Data Representation: Tally and graph data: bar graphs, line graphs, histograms, scatter graphs. Calculate medians, ranges, ratios, and percentages.

Data Representation: Tally and graph data: bar graphs, line graphs, histograms, scatter graphs. Calculate medians, ranges, ratios, and percentages.

Data Collection: Design and distribute additional surveys or interviews to fill in gaps in data.

Class Discussion: What orientation program is done in other schools, etc.? Evaluation of results of surveys, assessment of size and makeup of sample. Decision on orientation "program" they should work on (slide/tape show, booklet, film, directory, etc.) or direct action they should take.

Data Collection: To assess efficacy of orientation program at present school, in other schools/communities.


Class Discussion: What orientation program is done in other schools, etc.? Evaluation of results of surveys, assessment of size and makeup of sample. Decision on orientation "program" they should work on (slide/tape show, booklet, film, directory, etc.) or direct action they should take.
Presentation of data to principal to get permission for proposed "program" or other action.
Formulating rules of behavior.
Data Collection: Taking photographs and designing layout.
Data Collection: Measurements for maps of school, area, etc.
Data Collection: Getting information and material for booklet, directory, slide/tape show, etc.
Production of orientation "program" or trial of new rules.
Trial of new rules in specific situation.
Presentation of orientation "program" to principal, etc., for acceptance by school.
Class Discussion: Evaluating quality of "program," additional material needed, suggested revisions; assessing results of new rules.
Presentation of "program" or action to target population.
Collection and Analysis of Data: To test efficacy of "program" or action.
Optional Follow-Up Activities:
USMES Unit: Getting There
USMES Unit: Advertising
USMES Unit: Manufacturing
USMES Unit: Mass Communications

5. A COMPOSITE LOG*

This hypothetical account of an intermediate-level class describes many of the activities and discussions mentioned in the flow chart. The composite log shows only one of the many progressions of events that might develop as a class investigates the Orientation challenge. Documented events from actual classes are italicized and set apart from the text.

When several students are late on the first day of school, they explain that they had trouble in finding their new classroom. The teacher asks what other problems the students are having in being in a new class. Some students say that many of their friends are in other classes. Others say that it's hard having a different teacher. One boy remarks that he has moved into a new neighborhood and feels as if he is a new student in the school because he has to walk to school a new way. The teacher asks the class to think about the problems that new students have and whether they could do anything to help them.

> *While involved in a handwriting lesson, a student in a combination second/third-grade class in Iowa City, Iowa, wondered aloud whether or not the cursive alphabet would be displayed above the chalkboard in the intermediate classrooms to which the third graders would be assigned the following year. The teacher asked the children to share their thoughts about entering the intermediate unit. After much discussion the children decided to find ways to help themselves and other third graders adapt to the intermediate unit. (See log by Dorothy Wilkening.)*

The next day the students listed all the problems they think that new students might have, including (1) not having friends, (2) not knowing way around school, (3) not knowing rules of school, and (4) not knowing any of the teachers.

> *Because they were being temporarily housed in another school while their new school was being finished, a fourth-grade class in Burnsville, Minnesota began by discussing how they felt about their surroundings. When they decided to find out about their new school, they listed on three boards all the things they wanted to know, including--*

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*Written by USMES staff

How to get to know people.
Where the lockers and bathrooms are.
Were there tables, desks, or desk suitcases?
How would grading be done?
How many per room?
Size of library, lunchroom, playground.
Were the rooms carpeted?

(See log by Grace Stormoen.)

One student suggests that they can make a handbook or student directory that could be given to new students. The teacher asks whether the handbook might also be useful to new teachers, teacher aides, or student teachers. The students reply that it could be used by everyone. The class then brainstorms things that should be in the booklet. The various suggestions include (1) a map of the school building, (2) a list of students and teachers, (3) a list of after-school clubs, (4) a list of school rules, and (5) a description of the school program.

In a class in Iowa City, Iowa, students working on the school booklet committee met to discuss the length of the booklet and to decide on writing assignments. A list of the subjects to be included in the booklet had been developed by the entire class during an earlier discussion. Enough copies had to be printed to insure distribution to new parents and students at a meeting scheduled mid-way through the first semester to familiarize them with the school program. (See log by Florence Duncan.)

Students in a combination fifth/sixth-grade class in Lansing, Michigan, decided to publish a class newspaper to keep parents informed of student activities. During a class discussion the children suggested several ways of selecting staff to work on the paper, discussed each method, and decided to base their decision on the results of a teacher-prepared test. The eight children who scored the highest on the test met as a committee to delineate necessary jobs and decide on ways their classmates could be involved in the project. (From log by Diedra Boles.)

While discussing the contents of the booklet, one student says that photographs would help. The suggestion is then made that they could make a slide/tape show and show it to parents at the PTA meeting. Another student says that they could also show it to other classes. The class discusses the possibility of making both a booklet and a slide/tape show. They find that enough students are interested in each of the two projects to make good-sized working groups. One student suggests that slides made by the group making the slide/tape show could be enlarged and put in the booklet as photographs. The class agrees to work on the two projects but to report frequently to see how any work might be shared.

During the next several sessions the groups begin working on their problems. One girl from the group preparing information for the booklet writes a letter to the principal of the school to request an interview to obtain material about orienting new students to the school. Other students write to request permission to photograph parts of the school.

> *To obtain information about their new school, the Burnsville students wrote letters with questionnaires enclosed to the principal, assistant principal, media specialist, art teacher, gym teacher, and music teacher. They prepared and critiqued several drafts before the letters were finally sent out. (See log by Grace Stormoen.)*

After receiving permission to photograph portions of the school, the group working on the slide/tape show makes a list of the areas they feel would be most beneficial to photograph. They obtain a camera, purchase film and flashbulbs, and begin to take slides around the school. They decide to limit the list to twenty since that is the number of pictures on their roll of film. They finish taking pictures and send the film off to be developed.

> *The students in the Athens class found that it would be less expensive for them to take their own slides than to duplicate slides that were available to them. They borrowed a camera, purchased film and flashbulbs, and took pictures around the*

> *school. They tried to show as many sixth graders as possible because the show was for incoming sixth graders. (See log by Sherry Malone.)*

The group working on the student directory makes a list of the various items they feel should be included. Some of these are students' names and telephone numbers, school map, stories, teachers' names and pictures, class schedules, locations of recreation areas, puzzles, and school teams. They realize that all of these cannot be included because of space limitations, and they decide to survey the school to find out which items are preferred. On the survey form they list all the items that were mentioned in the class discussion, and they ask each student to indicate the five items he considers the most important. They then write the survey on a ditto master and run off enough copies to survey one class at each grade level since there are too many students in the school for everyone to be allowed to respond.

> *A survey group was formed in the Iowa City primary class to determine what information other third graders wanted to know about the intermediate unit. Two committee members administered the survey in the other class. The data was compiled by the entire committee and graphed. The information was presented to the class and incorporated into class plans, for example, several of the students surveyed wanted to know about the curriculum in the intermediate unit--a topic not previously selected by the group--and the class agreed to gather the information for them. (See log by Dorothy Wilkening.)*

While the students working on the slide/tape show are waiting for their slides to be returned, they begin to write the script for the show. At first they merely repeat what could be seen in the picture. However, after reading some of these descriptions to the rest of the class and getting negative reactions, they decide to rewrite the script to make it more interesting. In order to get a broader spectrum of ideas, they ask the whole class to help them by looking at the slides when they come back from the developer and offering their comments.

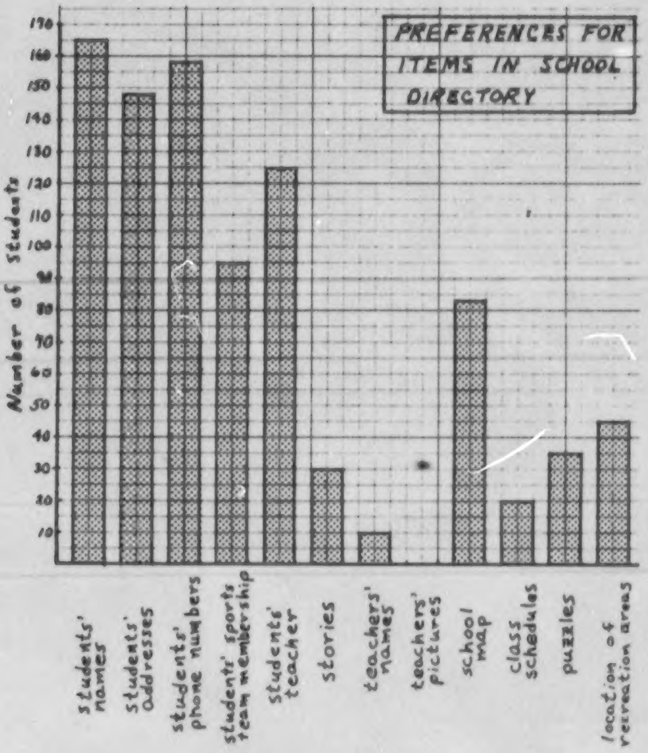

Figure B5-1

The Iowa City class had two different groups working on the slide/tape show which caused some problems. Coordination of the slides taken by one group with the dialog written by another group was impossible until the two groups began working together. Written comments were made as the slides were viewed and were later turned into a final script. (See log by Florence Duncan.)

The next session is spent on this activity since the slides have come back. Everyone has some comment to make, and the process of rewriting is very slow. Finally, the script is ready, and a reader is chosen.

The Athens class prepared their slides and wrote the script by flashing the slides on the screen and pooling their comments on each slide. Several students auditioned for the part of the reader. A taped sample of each one's reading was given to the language arts instructor for her evaluation. She chose the one to be the reader and offered comments on speech errors. (See log by Sherry Malone.)

The student directory group gets their survey back and begins to tally the responses. Using the "How To" Cards, they make a bar graph of the number of responses for each item (see Figure B5-1). They find that the items receiving the most votes are the student's name, address, phone number, teacher, and sports team membership. They design a form with these items on it and ask the school secretary to ditto it. They then distribute the form to all the classes.

A class in East Lansing, Michigan, that was making a school directory prepared a grid form for each student. The grid had spaces for the name, address, phone number, birthday, team, homeroom, tribe, and grade. Each student took some of the forms to his assigned homeroom and answered questions about the form. Three days later all the forms had been returned. (From log by Howard King.)

During the class discussion of the two projects, the slide/tape group becomes interested in the idea of a survey because they want to make sure that their show answers questions that new students have about the school. They decide to distribute a survey to new students. The questions will be designed to identify what activities, rules, etc., those students would like to have known when they started in the school. They feel that the answers to some of these questions will help not only new students but also teachers coming into their school.

During the class discussion the booklet group asks whether the photographs and questions could be used in a larger student handbook. Some members of the class point out that a student handbook may be too great an undertaking unless the school administration is willing to help them with it. One student suggests that a map of the school would be a great help to new students and that it could be included in a student handbook. The class finally decides to go ahead and publish the school directory as soon as possible and then start working on a larger student handbook.

The student directory group finally receives their forms and, by checking the student roster in the office, finds that everyone has returned a form. They decide to list the names alphabetically and to hire some of their parents to type stencils. They feel that they cannot afford to supply a directory to every student in the school and that the best solution is to charge for the directory. However, they must first find how much each copy will cost.

> *In the East Lansing class the students decided to list the names alphabetically and to have the directory printed. One student acted as purchasing agent and investigated the prices of paper. They figured they would need fifteen pages to get all the names in and estimated that they would need 300 copies. Several of the students' mothers typed stencils for $.50 each, and one artistic student then illustrated each page with cartoons of sporting activities. (From log by Howard King.)*

The group finds that the cheapest paper they can buy is that supplied by the school, and they decide to use that. They ask the class about the cover. Everyone wants to use a "fancy" cover, as on a regular telephone book. One student then investigates that cost and possible colors of this type of paper. The class decides on yellow but is surprised at the cost. The group then asks whether the rest of the class can help them for a few days in preparing the books for sale. The class agrees to help when the pages have been run off.

> *The Iowa City class based their selection of a printer for their school booklets on cost and quality. The class decided to hold a bake sale to cover the costs of printing both the school booklet and the write-ups of new students. During a class discussion, students decided on the title and credits for the booklet. Committee members chose green for the color of the cover and yellow for the color of the pages of the booklet. When the printed copies were complete, the class collated and stapled the booklets and verified the page order of each one. (See log by Florence Duncan.)*

The slide/tape group agrees that they could include a map of the school in their show by trying to find blueprints for accurate measurements. However, because these are not available and because the only map they can find is inadequate, they decide to measure the building themselves using a trundle wheel and then to construct a scale map.

> *The measuring group of the Iowa City primary class decided to prepare maps of various rooms in the intermediate unit. They worked in groups of two, preparing a rough sketch of the school and collecting measurement data. Many of the children decided to convert their measurements from inches to feet before selecting appropriate scales for their maps. They used the "How To" Cards on making a drawing to scale. (See log by Dorothy Wilkening.)*

> *The Athens class obtained a surveyor's tape measure and began measuring the building. They decided to round off each measurement to the nearest foot. When they had finished, they showed the map to the class. Some children said the map was not correct*

> *and measured the building themselves. They found that the two wings of the building were not symmetrical, as the first group had assumed. (See log by Sherry Malone.)*

> *Two children in the Iowa City class experienced difficulties while preparing a scale drawing of the school to be included in the booklet. They worked from an existing map of the school. One of the students discovered an error in the scale indicated on the map. The teacher held a skills session on the method of determining the scale from a blueprint or a sketch. In addition the children used the "How To" Cards on making a scale drawing. They measured several areas of the school, compared the measurements with the scale, and discovered the error. (See log by Florence Duncan.)*

Having finished their measuring, the group draws their map of the school. They use the "How To" Cards on scaling to reduce the map to a size which will fit on one sheet of paper. When the reduction is finished, one student draws the map to scale on a stencil and copies are run off. When they show the map to the class, the student directory group asks whether they can use a copy in the directory. The group readily agrees to this.

> *Two students in the Athens class decided to make a student handbook for incoming students. They planned to write, illustrate, and type it themselves. The class suggested various items, such as sample lunch menus and places to go, that might be included. The map of the school (reduced to scale) was also included in the handbook. (See log by Sherry Malone.)*

The student directory group receives all the copies of the pages of their directory and finds that they will have to charge twenty-five cents for each copy in order to make any profit. For one session the whole class helps collate and staple the directories together. Members of the group then sell them during lunch break and recess. The directory sells well and most comments about it are favorable.

> *The East Lansing class formed a corporation with their own bank account. The cost of their production was $38. They figured that they would have to charge 25¢ for each directory to make a profit. They set up an assembly line in the lunch room and proceeded to assemble the books. When they had finished, they had 328 books. They sold the directories during lunch and after school for two weeks. They also made announcements over the public address system to remind students to buy directories. As a result, they sold 290 directories. (From log by Howard King.)*

> *The Athens class found that printing costs for the student handbook were far greater than they could afford. Every printer quoted them a price over $100. They were eager to produce the handbook since the principal and teachers, as well as the students, thought it was an excellent idea. They then found that they could duplicate 100 copies for only 7¢ a copy. Unfortunately, the school secretary could not get the stencils typed before the end of school. However, she agreed to do it over vacation. The two boys planned to collect the booklet from her at the beginning of August, duplicate it during the month, and distribute it to new sixth graders at the beginning of the school year. (See log by Sherry Malone.)*

The slide/tape show group puts the finishing touches on their script and adds a few slides that other students feel are important. They show the result to the principal, and he is quite pleased with the result. He compliments them on their work and asks whether they would like to present their program at the next Parent/Teacher meeting.

> *The class in Athens finished the script for the slide/tape show but several attempts to record it were spoiled by noise and interruptions. The six students working on the slide/tape show were asked by the counselor to visit the three elementary schools in the area to present the show to the students who would be coming to the Hilsman School*

> *the next year. They would introduce the slide/tape show and answer questions about the school. When the time came for them to present the show, the tape portion had not yet been recorded; so they simply read the script while the slides were being shown. They then took the new students on a tour of the school building. (See log by Sherry Malone.)*

During the spring the class begins to think of the problems they might have in the school they will be entering in the fall. They decide to find out what information will be available to them as new students and whether they can prepare a similar orientation program for the other school. They decide to write a letter to the principal of the school requesting the orientation materials that are available.

After looking over the student handbook that was sent to them from the middle school, they decide to request permission to photograph areas of the school and collect information they feel would help themselves and other new students to the school.

> *The Athens class worked on orienting themselves to the high school they would attend the next year. They interviewed the principal, photographed areas around the school, and distributed a questionnaire to the ninth graders to find out what information would have been useful to them. (See log by Sherry Malone.)*

The group working on the middle school orientation finishes their survey form and obtains permission to distribute it at the middle school. The form includes such questions as "check the four things which you found most confusing when you entered the middle school: new building, new classrooms, new teachers, new students, new rules, new books, new courses." After they distribute the survey form at the school, they have their interview with the principal. He answers many of their questions about the school and provides them with a map of the school. He tells them that their work may be considered when a school handbook is prepared.

For a parent-teacher conference for parents of all students going to the new school, the Burnsville students prepared a large poster display of information about their new school. To large sheets of Tri-Wall painted various colors they attached posters, letters to teachers and replies, letters to students and replies, questionnaires, pictures they had taken of the new school, drawings of both the inside and the outside of the new school, graphs of information received from various classrooms, pictures of students in action, and a sample of the newsletter they were producing. In all there were sixteen large posters and a selection of twenty slides showing the school under construction. (See log by Grace Stormoen.)

6. QUESTIONS TO STIMULATE FURTHER INVESTIGATION AND ANALYSIS

- What new situations have you had to face at school or in the community?
- How do you feel when (new situation)?
- How could you find out how others feel in (new situation)?
- What would make people feel better about (new situation)?
- How could you find out what other students think would make them feel better about it?
- What can we do to help students feel better about (new situation)?
- How could you organize yourselves to best collect the data you need?
- How big should your sample be?
- How should you pick your sample?
- Will the answers you get from your questionnaire really tell you what you want to know?
- What is a good way to keep a record of your data?

- How can you make a picture of your data?
- What does the range of your data tell you?
- What does the median of your data tell you?
- What can you do to make the orientation "program" better?
- What will help you convince other people that your "program" will help?
- What plans need to be made for presenting your "program"?
- To which group of people should your "program" be presented?
- How can you find out if your "program" makes people feel better about (new situation)?

C. Documentation

1. LOG ON ORIENTATION

by Dorothy Wilkening*
Ernest Horn School, Grades 2-3
Iowa City, Iowa
February 1975-May 1975)

ABSTRACT

This class of second and third graders began their investigations of the Orientation challenge as a way of helping themselves and others adapt to the intermediate unit to which many would be moving in the fall. The children soon agreed to share the information they planned to gather with the other combination second/third-grade class. The other class was surveyed to determine what they wanted to know about the intermediate unit; once the data had been collected and analyzed, the children used the results as an additional guideline for their investigations. The children worked in several groups which included a survey group, a measuring group, a directory group, and a slide group in preparing materials and gathering information. This information was presented by them at an orientation meeting for themselves, the other second/third-grade class, and several mothers. In addition to preparing a student directory and slide show, the class arranged to spend one half-day in a fourth grade class at which time they got a sense of what being in fourth grade would involve.

During a class meeting in early February I told my students about an incident that had taken place earlier in the day. While involved in a handwriting lesson, someone had asked whether the cursive alphabet were displayed above the chalkboard in intermediate rooms as it is in our room. The student was concerned that there would not be a place to which to refer when unsure of how to make a certain letter. A classmate commented that some of the rooms have them but that the letters are not necessarily in alphabetical order.

I asked the children whether they ever thought about entering the intermediate unit. I encouraged each child to share his/her thoughts about the move with the rest of the class and then asked students who were afraid of moving into the next unit to raise their hands--a majority of the class raised their hands. We continued to discuss their concerns, which included the following items:

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*Edited by USMES staff

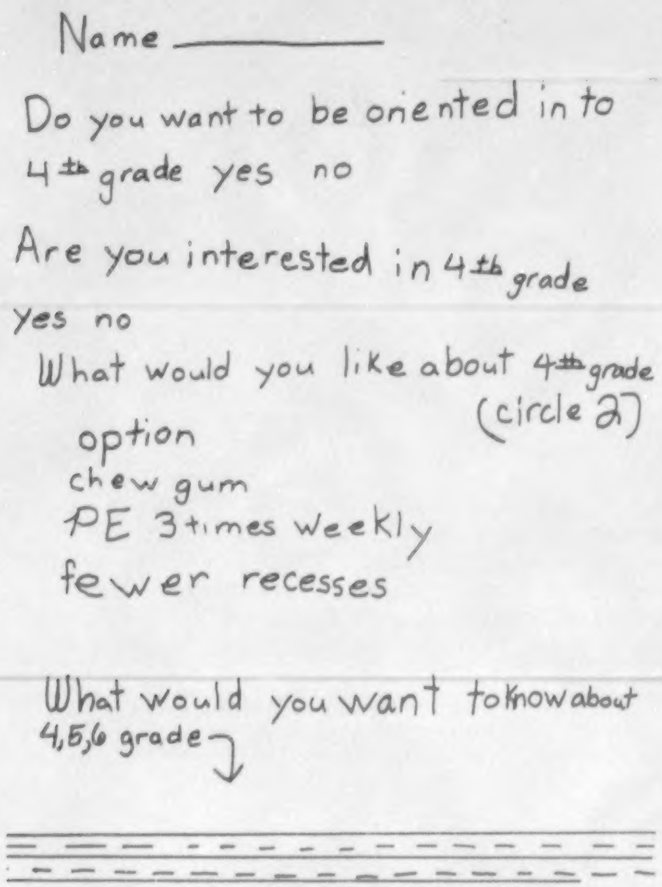
1. You are in a grade where you don't know a lot of people.
2. You have to write in cursive all the time.
3. In third grade you are the oldest in primary, but when you more to intermediate, you are again in the lowest grade.
4. When you are the oldest in the grade, you feel more confident.
5. The work will be hard because we won't know what is expected of us.

I then tried to focus the children on the problem at hand by commenting that knowing about something makes it less frightening because it then becomes familiar. One student commented that knowing about something makes it easy and fun, while not knowing makes it scary. I reminded the children that they would be third graders for four more months and asked whether they would like to find out something about the intermediate unit. There was agreement that this would be a good idea, and the students formulated a preliminary list of things they would like to know:

1. Will there be a cursive alphabet over the chalkboard?
2. Will we be in a fourth-grade room or mixed in with fifth and sixth graders?
3. Will we have the same kind of furniture?
4. Are there schedules?
5. Do they divide into groups?
6. What are the subjects they study?

I suggested that by finding the answers to their questions about the intermediate unit they would feel more at home in the fourth grade. I asked my students whether they knew a word for trying to find out about and get acquainted with something new. After many suggestions, I introduced the word orientation. Before ending the session we discussed whether or not the second graders would be interested since they would be in fourth grade in a year.

The children then discussed ways to include the other combination second/third-grade class in their project. One of my students suggested that we could survey them to de-



Name ________

Do you want to be oriented in to 4th grade yes no

Are you interested in 4th grade yes no

What would you like about 4th grade (circle 2)

option
chew gum
PE 3 times weekly
fewer recesses

What would you want to know about 4,5,6 grade ↓

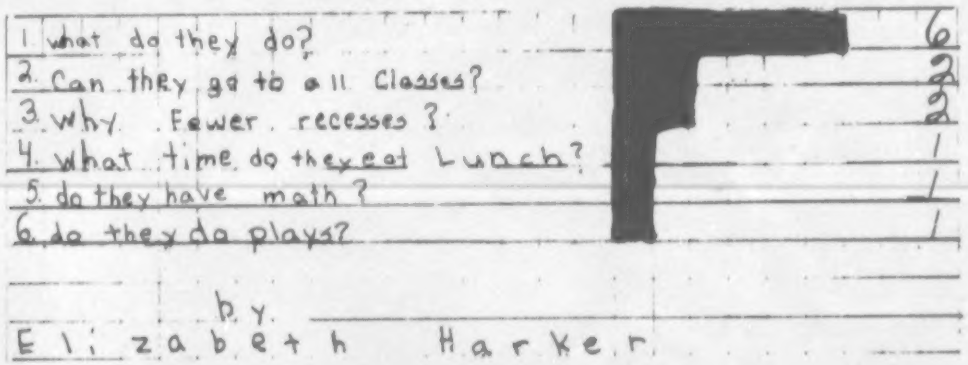
Figure C1-1

termine what they wanted to find out about the intermediate unit. Seven children, who later became part of the student directory group, volunteered to work on a survey. Once the survey questions were developed, each student prepared a duplicating master of the survey; several copies of each master were duplicated for use in the other class. A copy of the survey is shown in Figure C1-1.

Members of the survey group decided that two people could administer the survey. After a lengthy discussion they decided to put slips of paper with their names on them into a shoe and select two names. The other second/third-grade class was very receptive to the work my class was doing. They had many good questions which they wrote on their surveys.

The two children who administered the survey returned with the completed replies and the committee began to compile the information. I asked the children what they planned to do with the information from the survey, and one child responded that they were going to report to the rest of the class what they found out from the survey. Committee members hoped that some groups could work on some of the problems designated by other third graders; for example, several students asked questions about the curriculum in the intermediate unit, something that could be investigated by other students.

During our next class session, the students who worked on the survey reported to the class. One member said that the results are written on a piece of paper. I asked the children what they could do with the results in order to share them with everyone and what they planned to do with the information. The children responded that they wanted to find the answers to the questions that people had asked



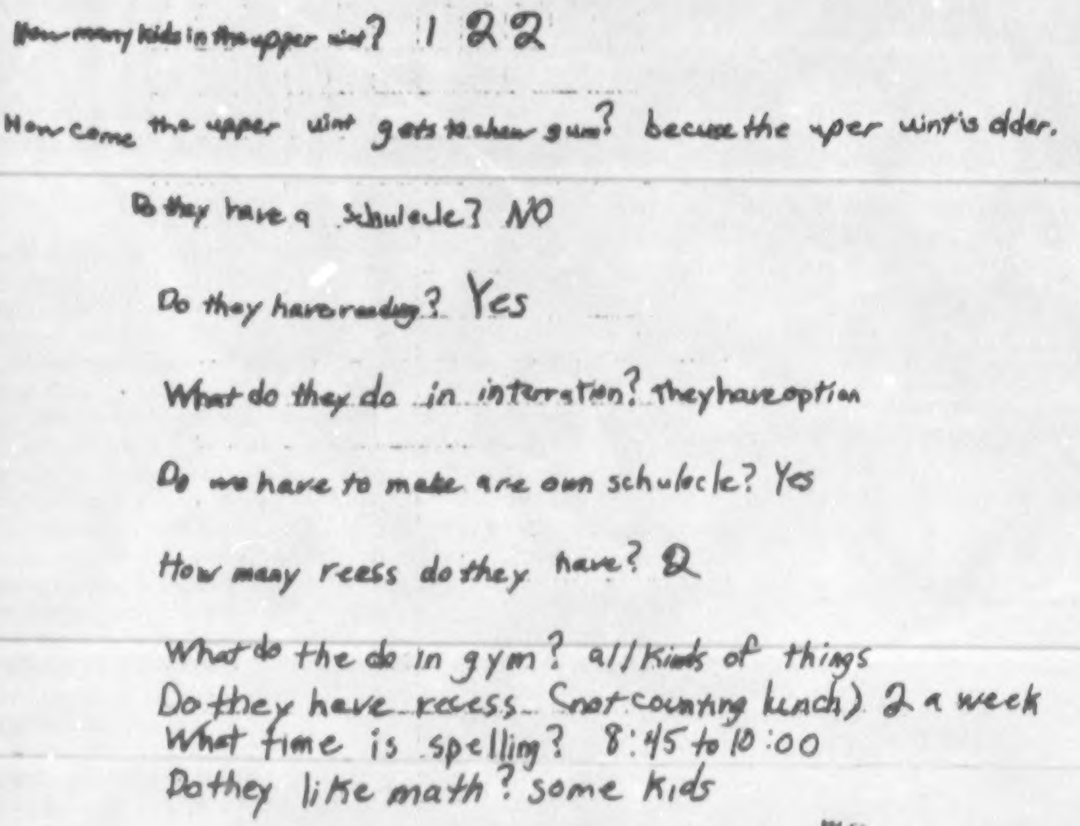
1 what do they do?	[redacted]	6
2. Can they go to all Classes?	[redacted]	2
3. why Fewer recesses ?	[redacted]	2
4. what time do they eat Lunch?	[redacted]	1
5. do they have math ?	[redacted]	1
6. do they do plays?	[redacted]	1

by
Elizabeth Harker

Figure C1-2

and to report the information to the other classroom. In addition they prepared a graph of the questions raised by those students who were surveyed. (A copy of the graph can be seen in Figure C1-2.) Several students then decided to survey our class to find out what they would like to know about the intermediate unit.

The other students in the survey group visited a classroom teacher in the intermediate unit to arrange visits to all of the curriculum areas and check the schedules. With the arrangements made, the children planned their visits and thought of questions to ask. The areas covered included reading, math, spelling, social studies, and science. They planned to lead a question-and-answer session at the slide show presentation. A chart with the information they gathered can be seen in Figure C1-3.



How many kids in the upper unit? 122

How come the upper wint gets to chew gum? becuse the uper wint is older.

Do they have a schulecle? NO

Do they have reading? Yes

What do they do in interration? they have option

Do we have to make are own schulecle? Yes

How many reess do they have? 2

What do the do in gym? all Kinds of things
Do they have recess (not counting lunch) 2 a week
What time is spelling? 8:45 to 10:00
Do they like math? some kids

Figure C1-3

I began the next session by restating the challenge: "How can you go about orienting yourselves to the upper unit to which you will be moving next year?" The children were interested in first determining the people to be oriented, and together we formulated a list that included (1) our class, (2) the other second/third-grade class, (3) people who move ahead a year, (4) parents, (5) relatives, (6) substitute teachers, and (7) student teachers.

I asked the children how we could share the information that we collected with all of the people they listed. One student suggested that we take pictures of the upper unit to show to people who would like to see them. A classmate suggested that we take slides rather than pictures so that they could be shown on a screen. The class agreed that a slide show would be better than a book of pictures. No one knew the cost of slide film or of developing it; one student volunteered to gather the information. I asked the children how they were planning to pay for it and several ways were suggested:

1. Each child could bring in 25¢.
2. Find out if there is school money for slides.
3. Find out if USMES would pay for slides since the project had paid for slides taken of the class's first unit.

Several children volunteered to write to USMES about reimbursement for slides.

During the next class session we discussed other ways to find out about the intermediate unit besides taking slides. Other suggestions included (1) a student directory, (2) a get-together party, (3) tours of the unit, (4) making a map of the unit. Working committees were formed to act on the suggestions. The committees were (1) a measuring group to prepare maps of the intermediate unit, (2) a student directory group, (3) a slide group, and (4) a tour group. They postponed the formation of committees to arrange tours and a get-together party until the other committee work was completed. The entire class discussed preliminary plans for the different groups and decided to begin group work at the next class session. From this point the groups worked simultaneously, but separately for the most part, except for interactions during class discussions. I held class discussions often because I view them as an important part of the problem solving process--they give other groups a chance for input into the activities of each group. For clarity, I will report the activities of each group separately.

Measuring Group

Members of the committee that was to collect measurements of the intermediate unit met with me to discuss their plans. I arranged the meeting because the children in this group appeared unable to decide on specific actions to take. Their immediate concern was to measure the furniture in our room and in the intermediate rooms and compare the data. After much discussion they acknowledged that they needed permission from intermediate-grade teachers and discussed what to do with the measurements. They planned to make a map of the intermediate unit using a scale of 1:2 as they had done for the stop sign while they were working on Bicycle Transportation. I asked them if they planned to use a ruler to take their measurements. A lively discussion ensued after which the children agreed that a measuring tape or a folding ruler would be more appropriate. They found the measuring tools in the Design Lab.

During the next full class discussion, members of this committee reported to the class that they had divided into small subgroups to measure various rooms in the intermediate unit. Hoping that input from their classmates would help them focus on the problem, I asked the class what our purpose was. Several students responded that it was to "orient themselves to the fourth grade and intermediate unit." Classmates suggested that they should be drawing pictures of the intermediate unit rooms with walls, doors, and windows clearly marked and measurements included. These, they continued, would be used to make a map that would be distributed to all third graders. After the class meeting ended, the students on this committee went to different rooms to begin collecting data. This was very challenging as each room is a different shape with many walls and partitions.

A pair of students completed a picture of the area on which they were working and began to measure the different parts of the room. Other members of the group continued to have difficulty recording their measurements. The two boys showed their drawing to their classmates during a class meeting. Students questioned whether everything was included in their drawing and suggested that a key be used to indicate various things in the room, e.g., = accordion wall. The entire class agreed with the suggestion.

All but one pair of students took their measurements in feet. The other two students were confronted with the problem of converting their measurements from inches to feet. Since they hadn't learned to divide, each developed and executed a plan completely on his own--one was more successful than the other. One youngster wrote down the number 12 several times on a sheet of paper and tried to keep the totals in his head. The other student wrote a column of multiples of 12--12, 24, 36, 48, 60, 72, 84--his column correctly listed the "12 table" through 20 x 12. He matched each measurement on his drawing to a figure from his column, counted the number of 12's that appeared until that figure, and determined the excess inches. This from a second grader! An example can be seen below.

12 90" = 7'6"
24
36
48
60
72
84, etc.

During the next class session the two students explained to me how they were translating their measurements from inches to feet. I asked them how they were planning to show fifteen feet on one sheet of paper and whether they had paper that big. One student suggested that they scale all the room maps to millimeters; however, not all of my students were familiar with the metric system--in fact, several students had questions as to what scaling was. I told the class that each measuring team would choose its own scale with which to work and that I would be available to help anyone who wanted my assistance.

The two students who converted their measurements from inches to feet decided on a scale of 1/2"↔1'.* They began to draw their room to scale and discovered that they would not have enough room on their piece of paper. Instead of changing their scale, they decided to add another piece of paper to their original. Group members experienced some difficulty in drawing the intermediate rooms to scale, and I suggested that they use the appropriate "How To" Cards.

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*Many classes have found it easier to work with graph paper, making one block represent a certain distance. If the drawing turns out to be too big or too small, then either smaller or larger blocks can be used to represent the distance or the distance per block can be made smaller or larger.

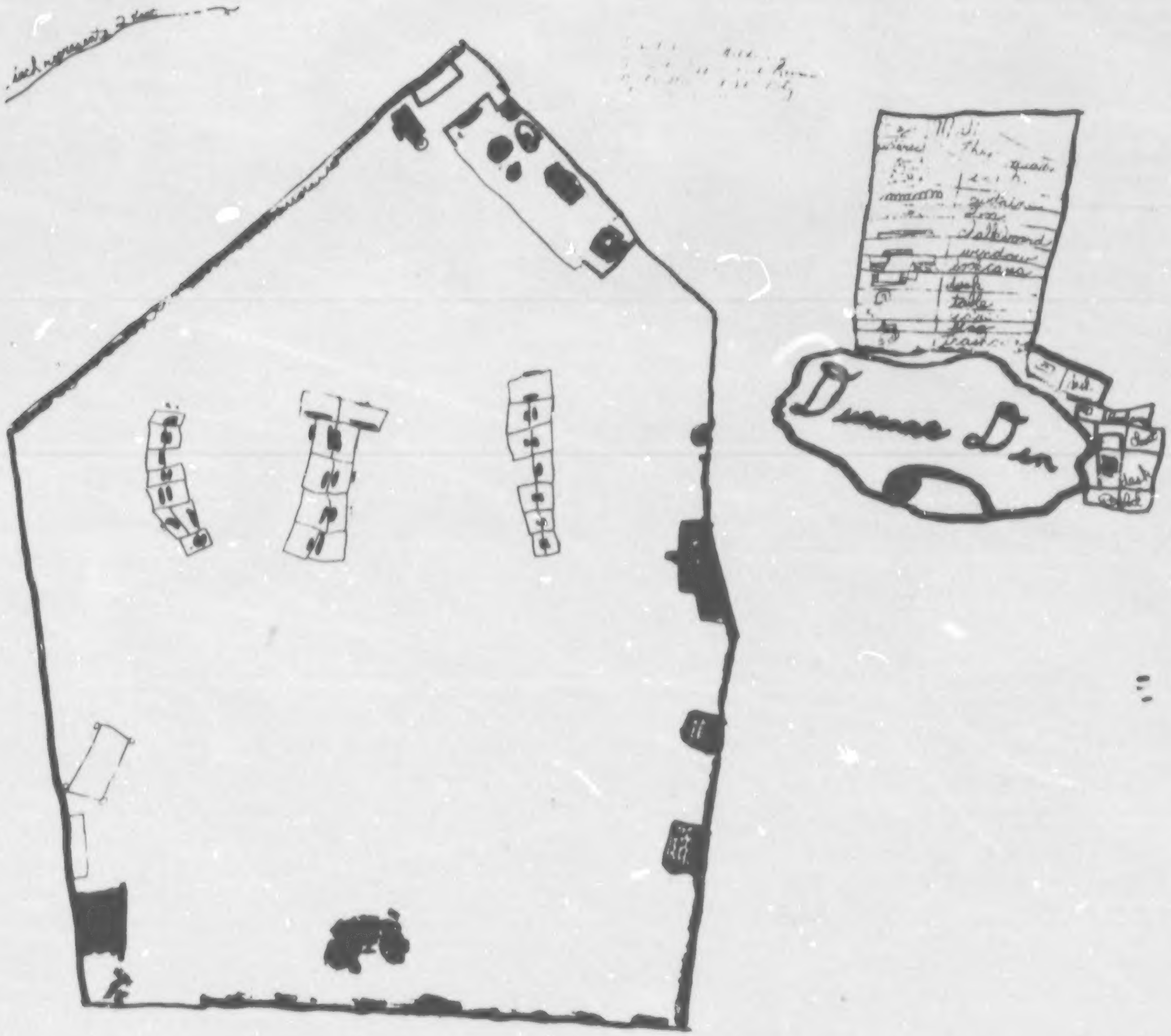
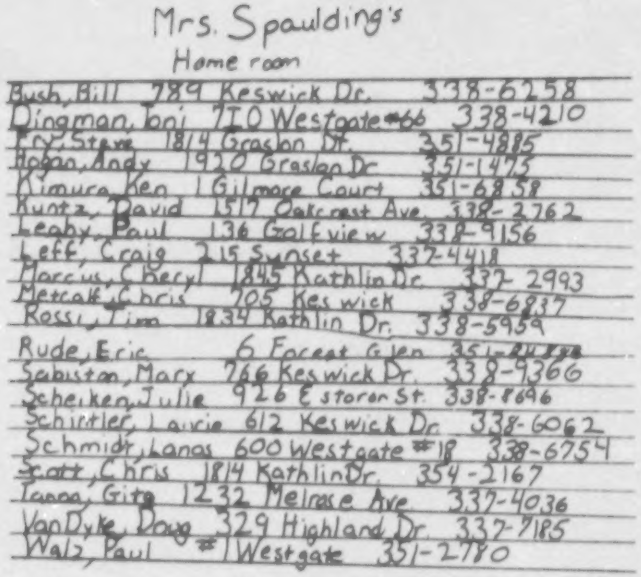

inch represents 2 feet
chalkboard
window
desk
table
trash
Den

Figure C1-4



Mrs. Spaulding's
Home room

Bush, Bill	789 Keswick Dr.	338-6258
Dingman, Toni	710 Westgate #66	338-4210
Fry, Steve	1814 Graslon Dr.	351-4885
Hogan, Andy	1920 Graslon Dr	351-1475
Kimura, Ken	1 Gilmore Court	351-6858
Kuntz, David	1517 Oakcrest Ave.	338-2762
Leahy, Paul	136 Golfview	338-9156
Leff, Craig	215 Sunset	337-4418
Marcus, Cheryl	1845 Kathlin Dr.	337-2993
Metcalf, Chris	705 Keswick	338-6837
Rossi, Tim	1834 Kathlin Dr.	338-5959
Rude, Eric	6 Forest Glen	351-[illegible]
Sabiston, Marx	766 Keswick Dr.	338-9366
Scheiken, Julie	926 E storor St.	338-8696
Schirtler, Laurie	612 Keswick Dr.	338-6062
Schmidt, Lanas	600 Westgate #18	338-6754
Scott, Chris	1814 Kathlin Dr.	354-2167
Tanna, Gita	1232 Melrose Ave.	337-4036
VanDyke, Doug	329 Highland Dr.	337-7185
Walz, Paul	#1 Westgate	351-2780

Figure C1-5

Two students finished their scale drawing before their classmates did and volunteered to explain how they changed their measurements from inches to feet as well as how to draw a room to scale. Some group members understood the process involved more quickly than others. A copy of one scale drawing can be seen in Figure C1-4. The last step in the preparation of the scale drawings was coloring them and drawing in the furniture. The drawings were to be shown to the children who came to see the slide show.

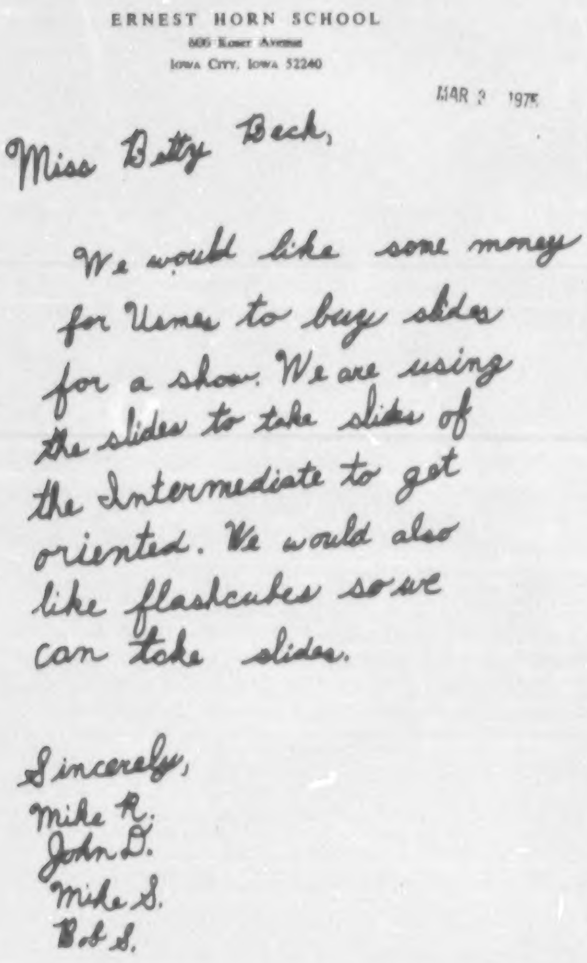
Directory Group

Students in the directory group decided to make a student directory of the names, addresses, and phone numbers of all third-, fourth-, and fifth-grade students at the Horn School. Plans were made to distribute one copy of the directory to each third-grade student. Someone suggested that the sixth-grade students be listed in the directory but that was quickly vetoed when one child observed that the sixth graders would not be at the Horn School next year. The suggestion to include pictures of students was ruled out because the children felt it would be too expensive. After some research, the children determined that there were forty-three students who needed copies of the directory and 143 fourth- and fifth-grade students to include in the directory. The children gathered the information they needed from student information lists at the school office.

The students on this committee decided to type their listings on duplicating masters which could be easily and inexpensively duplicated, collated, assembled, and distributed. Two of the students typing the directory decided that it would be easier to write the lists on duplicating masters. A subgroup of the committee prepared covers for the directory. There was a good deal of discussion of how the directories should be held together. Several children suggested yarn, but others observed that the yarn could easily break, and the committee finally decided to staple their booklets. Because one student's address and phone number changed after the directory was duplicated, each copy had to be corrected before the directories could be distributed. A page from the directory can be seen in Figure C1-5. The directories were well received by the third-grade students in the school; many of the second graders were upset to learn that they were not going to receive a copy.

Slide Group

Following up on an earlier discussion of ways to pay for a slide show on the intermediate unit, several children drafted a letter to USMES. The children proofread the draft,



ERNEST HORN SCHOOL
600 Koser Avenue
Iowa City, Iowa 52240

MAR 2 1975

Miss Betty Beck,

We would like some money for Usmes to buy slides for a show. We are using the slides to take slides of the Intermediate to get oriented. We would also like flashcubes so we can take slides.

Sincerely,
Mike R.
John D.
Mike S.
Bob S.

Figure C1-6

recopied it, and sent it on their own. A copy of the letter can be seen in Figure C1-6.

During the interim, students on the committee gathered information on film and developing costs and reported to the class that for $2.03 they could purchase film for twenty slides. In addition, a package of flash cubes with twelve flashes cost sixty cents. I asked the class how much each flash would cost and one boy quickly responded, "Five cents." The student explained that he found his figure by dividing sixty cents by twelve. Before ending the discussion, the class computed the proposed cost to date--$2.63. While waiting for a response to their letter, the slide group members joined the measuring committee.

Several class sessions later, the slide committee members received a response from the USMES Central Office. The project, according to the letter, would underwrite the costs of the slide show. The children were advised to get an advance, if needed, from the Design Lab money. When the receipts arrived, USMES would refund the money in the form of a check. After some discussion the class decided that they would keep track of who had spent money but the check from the project would be made out to me, cashed, and divided on the basis of the receipts. One student in the group decided to make a box in which to keep the receipts.

The five children who were going to take slides of various activities that go on in the intermediate unit discussed which activities they wished to show. After choosing the subjects for their pictures, they decided that, as each picture was taken, someone in the group would write down information about the activity being photographed.

This group had two cameras, one that took color slides and one that took only black-and-white pictures. When I asked the owner of the camera limited to black-and-white pictures what he planned to do with his pictures, he replied that he would pass them around the group of children who were viewing the slide show.

Unfortunately, many of the slides taken by the children came out dark. The children, however, remained enthusiastic and decided to present the slide show at the meeting as they had originally planned. Members of the committee surveyed the other third-grade class to determine a date for the slide show presentation. Based on the information collected, the presentation was scheduled for May 14 from 1:20 P.M. until 2:00 P.M.

During a class discussion held at the end of April, the children reviewed what they had done to date, what remained to be done, and how they planned to share their information with their schoolmates. A major portion of the discussion was devoted to organizing their presentation. The program, which is listed below, was developed by the children.

Program for May 14 Meeting

1. Showing of slides
2. Presentation of posters showing intermediate classrooms by measuring teams
3. Explanation of intermediate curriculum by five students who had interviewed intermediate teachers, e.g., reading, math, spelling, interaction
4. Question-and-answer period led by students who did survey on what people wanted to know

Someone suggested that invitations be written for the slide show presentation, and several children volunteered to work on this. The class was interested in distributing programs to those who attend the presentation, and time was spent preparing a duplicating master to be copied and distributed. Several students again raised the idea of visits to the intermediate unit. They agreed to ask one of the teachers if such visits would be possible.

The children spent the last three sessions before the presentation practicing the different parts of the program. They timed each segment to make sure that the program could be completed in the time allowed for it. An announcer was selected to introduce the student presentors. In addition to the other second and third graders, six mothers attended the program held in my classroom; the space considerations forced us to limit the number of people who attended the session. The program was very well received by all. The majority of questions raised during the question-and-answer period came from members of my class. It is interesting to note that the question which started the unit was the final question to be asked: "Are there cursive alphabet cards posted in the intermediate rooms?" This time, however, a classmate was able to answer: "They are posted in two of the five rooms." I reassured my students that by next fall, they would be sure of the letter formation.

A few days after the presentation, several students reported to their classmates that they had arranged tours of the intermediate unit for the class. A class list was given to a fourth-grade teacher who divided the third graders into two groups, one group per fourth-grade classroom. The children were invited to spend one afternoon in the fourth grade. Each third grader was assigned to a fourth grader who explained the program and answered questions. The fourth-grade teachers gave the third graders assignments similar to those they gave their own students. It was a real orientation to the intermediate unit. Upon the children's return, I asked them how they felt about entering fourth grade in the fall. I was happy to hear an overwhelming "We're not scared anymore!"

2. LOG ON ORIENTATION

by Grace Stormoen*
Cedar School/Sky Oaks School
Grade 4
Burnsville, Minnesota
(September-December 1975)

ABSTRACT

This class was one of two fourth-grade classes housed temporarily in Cedar School while a new school, Sky Oaks, was being built for them. Cedar School was one of ten schools in Burnsville in which students assigned to Sky Oaks were having their classes. Rather than being concerned with their current situation, the students were more interested in finding out as much as they could about Sky Oaks. They first listed items about which they wanted information, broke this list down into a few categories, and then listed approaches to obtain the information. Much of their subsequent work consisted of writing letters and questionnaires and analyzing the responses; they wrote to teachers, the principal and vice-principal, the librarian, and other classes. They obtained outdoor and indoor views of the school (from plans and photographs) and used them to draw or trace pictures to show to other students. Using their information, the class produced a bulletin to inform other students about Sky Oaks. To inform parents and teachers, they prepared a highly successful display of large posters showing letters sent and replies received, drawings of the inside and outside of the school, a sample of the news bulletin, pictures of the class working on the challenge, and graphs of information about other students going to Sky Oaks.

All of my students did not know one another at the beginning of the year because they had been transferred from four different schools. Given these circumstances, I was not sure whether the students would be concerned about any immediate adjustment problems at Cedar School or, instead, about the larger question of what to expect at Sky Oaks School.

I was scheduled to meet with this class for forty-five minutes three times a week during the block of time assigned for science. Because of various schedule changes we didn't meet until school had been in session for ten days. At our first meeting I asked them how they felt about their first ten days in school. Two students wrote the class's feelings and questions on the board:

---

*Edited by USMES staff

scared
strange
anxious
happy
lonely
bored
curious

wondered if the principal was nice
who the teacher would be
who the principal was
would school be hard
curious about the other kids
when was lunch
what happens if they forget their bus number
what if they miss their bus

The fact that they were "curious about the other kids" soon became the main topic of conversation. This led to a discussion of how they could get to know one another. For the next session I divided the class into three groups, handed out a questionnaire I had prepared, and asked the children to find out as much as they could about others in their group. The questionnaire was designed to have each student find out the names of those in his/her group and some of their interests, and to reveal how many knew some basic facts (e.g., name of principal, address of school) about Cedar School and Sky Oaks School. The class enjoyed this get-acquainted activity and afterward felt more at ease with one another.

I thought that these introductory activities had paved the way for an Orientation challenge. In our next class I asked what they thought the word "orientation" meant. They thought it had something to do with "from the east" or "Asian."* When I asked if there were a way to find other meanings for the word, a few students looked in the dictionary and found the term "adaption." Although I thought the ensuing discussion might focus on how we could adapt to the new environment at Cedar School, I found that the class members already felt comfortable at Cedar and were more interested in finding out about Sky Oaks.

Because this was the first time these students had been exposed to the USMES approach, I explained that they would be able to design a challenge and find answers to questions that were important to them. My role would be that of a person who might guide them toward helpful resources, but I would be learning with them and was not there to direct them or answer their questions. The students were delighted with this idea and came up with the challenge, "Find ways to find out about Sky Oaks."

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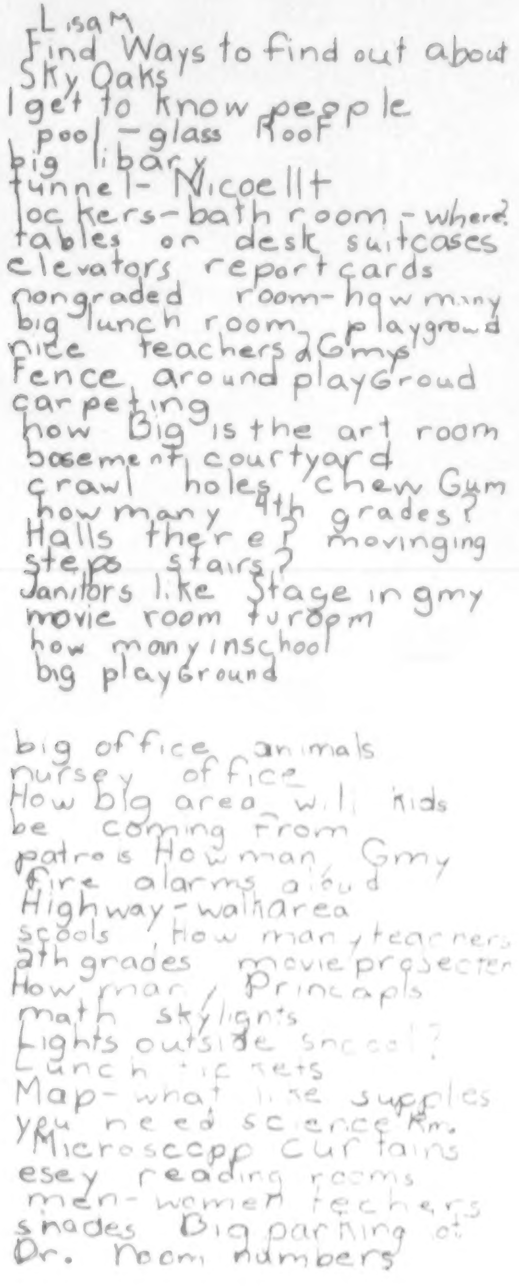
*In fact, this is very close to the origin of the word in that orient comes from a word meaning to rise, referring to the sun; hence, the meaning of facing the east.--ED.



Lisa M
Find Ways to find out about
Sky Oaks
I get to know people
pool - glass Roof
big libary
tunnel - Nicoellt
lockers - bath room - where?
tables or desk suitcases
elevators report cards
nongraded room - how many
big lunch room playgrowd
nice teachers 2 Gmys
Fence around playGroud
carpeting
how Big is the art room
basement courtyard
crawl holes chew Gum
how many 4th grades?
Halls there? movinging
steps stairs?
Janitors like Stage in gmy
movie room furoom
how many in school
big playGround

big office animals
nursey office
How big area will kids
be coming from
patrols How man Gmy
fire alarms aloud
Highway - walkarea
scools How many teachers
5th grades movie prosecter
How many Princapls
math skylights
Lights outside school?
Lunch tickets
Map - what like supples
you need science Rm.
Microscopp Curtains
esey reading rooms
men - women techers
shades Big parking lot
Dr. Room numbers

Figure C2-1

In subsequent sessions we reviewed the challenge and began to brainstorm what we wanted to find out about Sky Oaks. Three students recorded the ideas that were written on the board. (One student's list is shown in Figure C2-1.) The students then talked about how they might find answers to their questions.

Their immediate inclination was to go to the construction site and look around for themselves. However, some of the students had seen large signs near the site which warned of a heavy fine for loitering in the area. I suggested that we could look for other ways to get information, but of course this was not as exciting to the class as going through the barricades!

So that we would have a permanent record of our ideas that everyone could see, I rewrote the class's list of ideas on large sheets of butcher paper and posted them on the bulletin board. The students decided the list was overwhelming and had to be broken down somehow. They discussed this and agreed on the following tasks to be done:

1. contact librarian
2. find out about places in the school
3. get to know people who would be in the school
4. find out about graded vs. nongraded sections
5. find out about supplies

These tasks covered some, but not all, of the areas the children focused on during their work on the challenge.

Meanwhile, I had taken slides of the Sky Oaks construction site to enable the class to see different parts of the school in the construction stage. I hoped that this would alleviate the children's frustration at not being able to visualize the school and that it would discourage them from going to the site themselves. They enjoyed viewing the slides and were enthusiastic about proceeding with their challenge.

In October the children divided into a large number of small groups to obtain different types of information from various people who would be connected with Sky Oaks. Much of their work consisted of composing letters and questionnaires to be sent to the people who the children thought would know the most about a particular area of interest. For example, some of the students who wanted to find out about rules in the new school wrote to the principal and vice-principal and enclosed questionnaires. Others composed letters and questionnaires for the teachers, janitors, and librarian.

One group of students tried to devise a survey to be given to the other fourth-grade class at Cedar to find out what kinds of rules those students did or did not want. Another group wanted to find out about the students in other schools who would be going to Sky Oaks, but they had trouble deciding which classes to get in touch with and what methods to use. The idea of using a tape recorder to ask questions rather than writing a questionnaire appealed to this group. However, they had difficulty drawing up a list of questions to be recorded; they felt that their first draft asked more about teachers than children. They were also uncertain as to how the class(es), once chosen, would respond to questions on the tape recorder. By the end of their first group session, they had decided to get in touch with sixth-grade students in temporary quarters at Nicollet Junior High but had not yet decided what to ask them or whether they would use a written survey or a tape.

Class discussions revealed that there was some overlap of questions being asked by the different groups. Some of the students became quite upset about this and had trouble deciding which group should include a specific question and which group should delete it. After further discussion each group included some questions and deleted others as they felt it was pointless to duplicate questions.

Phrasing questions was also a difficult task for the students; sometimes they would draft a questionnaire and later discard it after realizing either that they didn't know why they had asked certain questions or that their questions would not elicit the information they really wanted. I decided to lead a skill session on asking questions to try to alleviate this problem.

First I showed the class a picture and then asked them questions which had a definite yes or no response. (For example, I asked if the boy in the picture was wearing a blue shirt.) After four such questions, I asked some inference questions, such as, "What just happened in this town?" (The town looked deserted and no single, clear-cut response was expected.) In the discussion that followed the children seemed to understand the difference between simple questions with yes/no answers and those that required a higher level of reasoning. We discussed the idea that in our Orientation challenge we should be aware of and use both types of questions.

By mid-October I felt that the children were making a good deal of progress on their challenge. Letters were ready to be sent to the media specialist, the art, gym, and music teachers, the principal, and the vice-principal. (See Figure C2-2 for a copy of one of these letters.) In addition, three boys had formed a new group and were projecting slides of outdoor views of the school onto large sheets of paper and tracing around them. Because it would be easier than carrying slides and a projector from one class to another, these boys were hoping to show their finished pictures to other classes so that they, too, could see what Sky Oaks looked like.

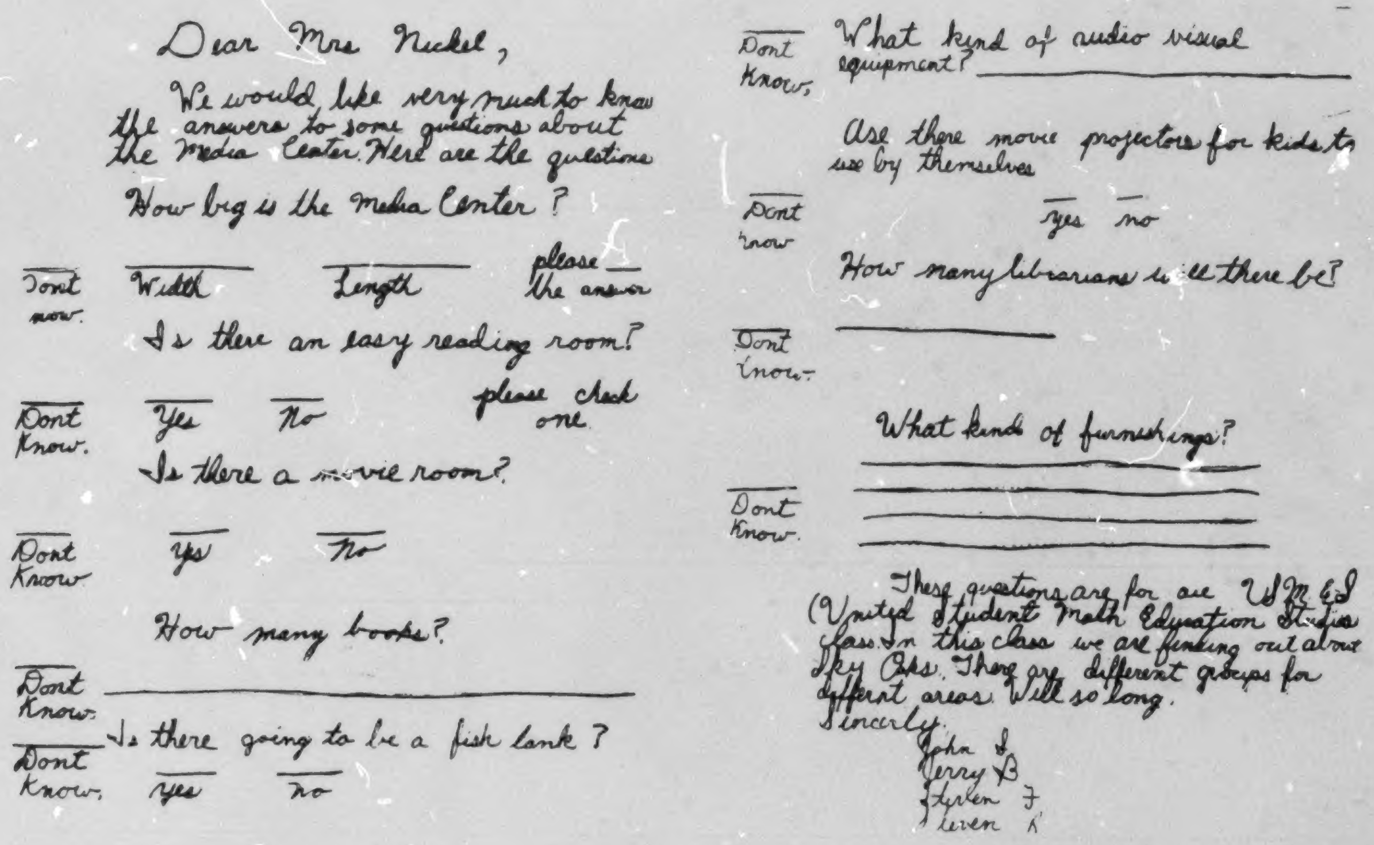
Within about a week after the letters were sent, responses began to arrive in the mail. Because she didn't understand what the students were trying to ask, the art teacher had written question marks on her letter and sent it back. The students realized that they still had trouble asking questions in spite of their attempts to phrase their questions more carefully.

The students reported on the results of the other surveys and questionnaires. There was absolute silence from the class as they found out--

- that they would get in after Christmas
- that the school would be carpeted in red, orange, purple (in different rooms)
- the size of the media center; the type of equipment in the center
- that there would be 8,000 books in the library
- what they might be doing in gym, art, and music
- what the school rules might be and much other information

The students also discussed a local newspaper story on a sprinkler fitters' strike that was preventing completion of the school. They discussed unions, wages, strikes, the effects of the strikes on others, and whether it was fair to hold up construction because someone wanted more pay.

The students were excited about all the information they had gathered but soon became frustrated because they weren't sure what they wanted to do with it. We discussed this new area of work that had developed--what to do with our information. Some of the students wanted me to assign them tasks; they still were not used to making their own decisions and proceeding with work on their own ideas. I tried to help them by talking about some of the ways we get information in our daily lives, such as through television, newspapers, books, magazines, tape recordings, slides, pictures,



Dear Mrs Nickel,

We would like very much to know the answers to some questions about the Media Center. Here are the questions

How big is the Media Center?

Dont know. ___ Width ___ Length ___ please ___ the answer

Is there an easy reading room?

Dont Know. ___ Yes ___ No ___ please check one.

Is there a movie room?

Dont Know ___ Yes ___ No ___

How many books?

Dont Know. ___

Is there going to be a fish tank?

Dont Know. ___ Yes ___ no ___

Dont Know. ___ What kind of audio visual equipment? ___

Are there movie projectors for kids to use by themselves

Dont know ___ Yes ___ no ___

How many librarians will there be?

Dont Know. ___

What kind of furnishings?

Dont Know. ___

These questions are for our USMES (United Student Math Education Studies class. In this class we are finding out about Sky Oaks. There are different groups for different areas. Well so long.

Sincerly

John S

Jerry B

Steven F

Steven K

Figure C2-2

(Ideas For Bulletin)

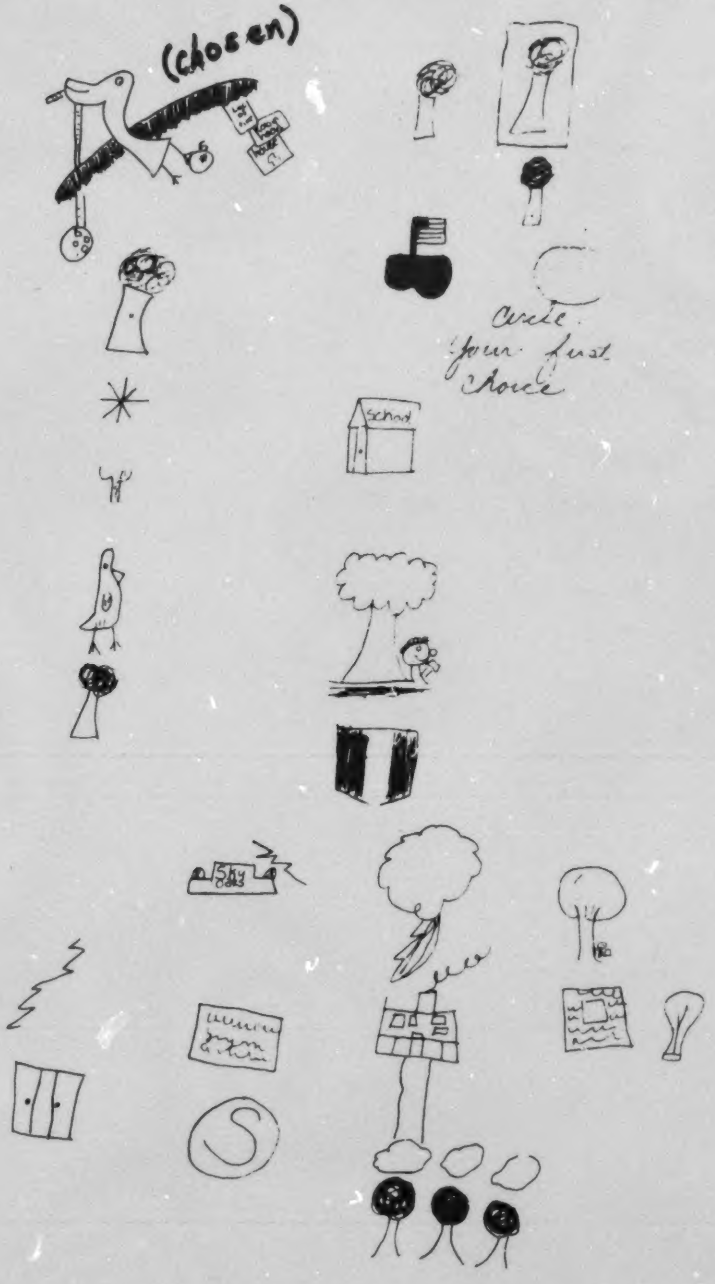
Sky flyer (chosen)
Sky Oaks information
Sky Oaks Bulliten
Sky Oaks
Bird
Sky Scene
Sky Oaks tribune
Tree
Sky Oaks
Shady Oaks
Oak tree

3

1 In-For-ma-tion School bulliten
2 Sky oaks news bulliten
3. Sky Oaks flash
4 Sky Oaks news Letter
5. Sky Oaks Book
6 Sky Oaks Times
7 News Flash
8 Sky Oaks News

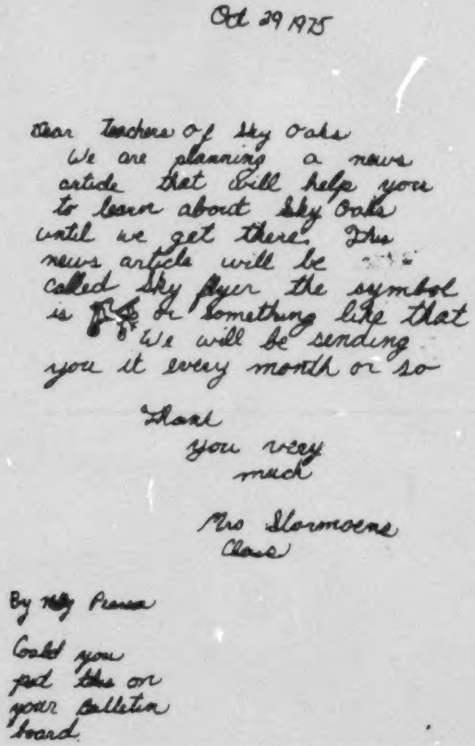
write your choices below: Write it out

1. ______ ______
2. ______ ______
3. ______ ______



Circle your first choice

Figure C2-3



Oct 29 1975

Dear Teachers of Sky Oaks
We are planning a news article that will help you to learn about Sky Oaks until we get there. This news article will be called Sky flyer the symbol is or something like that We will be sending you it every month or so

Thank
you very
much

Mrs Slormoens
Class

By [illegible] Pearce

Could you
put this on
your bulletin
board.

Figure C2-4

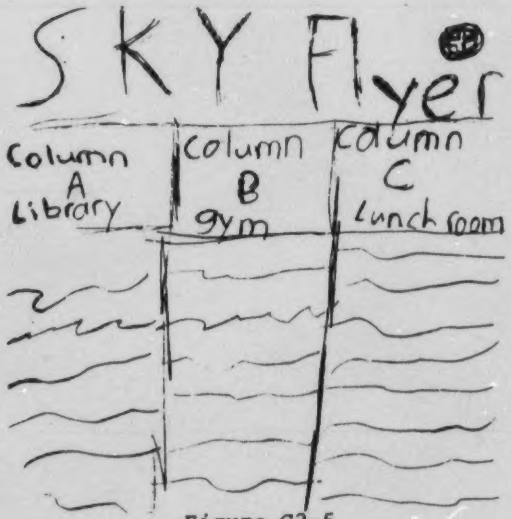


Figure C2-5

and posters. Then I asked if they could use some of these ways to dispense their information. The reactions varied: some students thought it would involve too much work; others wanted everyone in the class to do the same thing; still others thought that we needed more information if we were going to tell others about Sky Oaks. This last idea proved to be a popular one and encouraged some regrouping and new directions for the challenge.

To keep all the information readily available, one boy constructed a storage file. This was very helpful because students could then find information by themselves. One girl became so excited over the amount of interesting information we were gathering that she decided to develop a news bulletin to tell others. She began keeping a log of all the information that we received on Sky Oaks School.

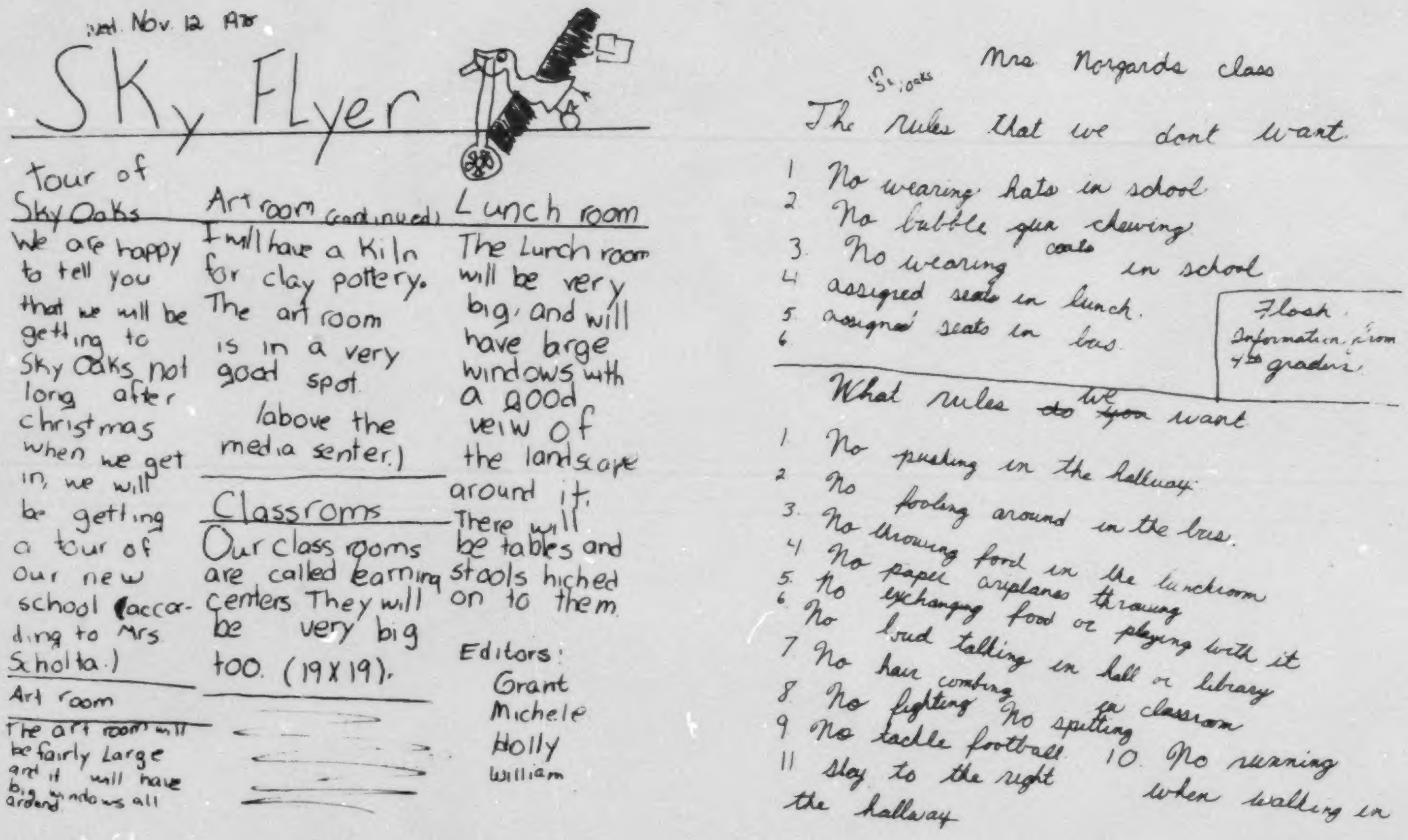
The class decided to have a contest to find a name for the bulletin. When one boy noted that a local paper had both a title and a symbol, the class suggested using the contest to choose both a name and a symbol.

Names and symbols for the bulletin were submitted and a committee of four was chosen to record them for the class vote. The students decided to let everyone in the class vote for first, second, and third choices for the name and first choice for the symbol and had the symbols and names traced onto a ditto master so that they would all look the same. The next day the vote tabulating committee announced that the name *Sky Flyer* had been chosen and that the symbol chosen was the bird (see Figure C2-3). As it turned out, the same girl had submitted both entries.

Several days later, the class discussed to whom they should send the bulletin. They finally chose to send a copy to each (Sky Oaks) teacher who would then either read it to the class or post it on the bulletin board.

The girl who was to edit the bulletin asked for some volunteers to help her and chose four classmates. This group then proceeded to draft some ideas for the makeup of the bulletin. One girl volunteered to write a letter (see Figure C2-4) to the other prospective Sky Oaks teachers telling them the bulletin was coming.

The Bulletin Committee began drafting articles from the information they had compiled and selected another member to help with the large amount of work because she was a good speller. One boy drafted a format for the front page (see Figure C2-5), and during the next week he proceeded to finish the first *Sky Flyer* (see Figure C2-6). However, neither the committee nor the class was satisfied. There was some



Vol. Nov. 12 1978

SKy FLyer

Tour of Sky Oaks

We are happy to tell you that we will be getting to Sky Oaks not long after christmas when we get in, we will be getting a tour of our new school (according to Mrs. Scholta.)

Art room

The art room will be fairly Large and it will have big windows all around

Art room (continued)

It will have a Kiln for clay pottery. The art room is in a very good spot (above the media senter.)

Classroms

Our class rooms are called learning centers They will be very big too. (19 X 19).

Lunch room

The Lunch room will be very big, and will have large windows with a good veiw of the landscape around it. There will be tables and stools hiched on to them.

Editors:
Grant
Michele
Holly
William

---

in Sky Oaks Mrs Norgards class

The rules that we dont want.

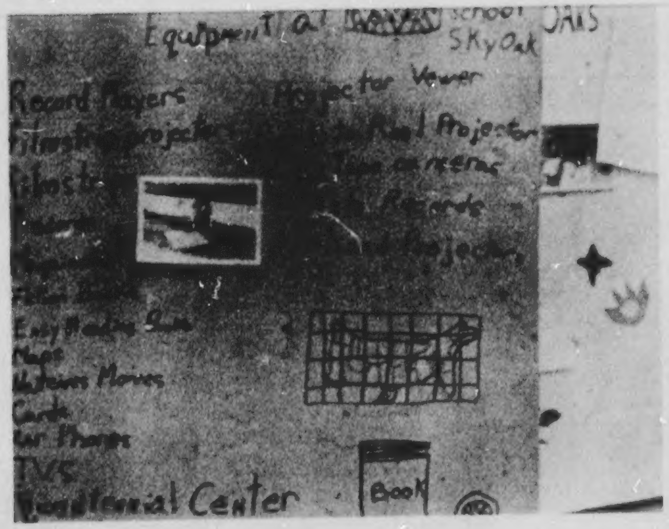
1 No wearing hats in school
2 No bubble gum chewing
3. No wearing coats in school
4 assigned seats in lunch.
5. assigned seats in bus.
6

Flash Information from 4th graders.

What rules ~~do you~~ we want

1. No pushing in the hallway.
2 No fooling around in the bus.
3. No throwing food in the lunchroom
4 No paper airplanes throwing
5. No exchanging food or playing with it
6 No loud talking in hall or library
7 No hair combing in classroom
8 No fighting No spitting
9 No tackle football
10. No running when walking in the hallway
11 Stay to the right

Figure C2-6



criticism that the chosen format was not used throughout the bulletin and that some information had been left out. They decided to continue working on it and postponed its distribution until December.

A few days earlier, during a class discussion on what to do with their information, the students decided to construct an information display area for the upcoming parent-teacher conference day in November. They decided to use some large sheets of Tri-Wall as posters and to mount their accumulated information on these. Several students began immediately to work on their posters, and there was a rush by all to assemble their information because the conference was only ten days away. Some small groups began painting their Tri-Wall various colors, and one group decided to take some pictures of the school to use with their display and spent the next five days doing this. As an attention-getter one group drew a cartoon of Snoopy camping out at the new school; beneath it were drawings of the new buildings.

Work on the display proceeded for the next week as the students assembled their information on the posters. The posters were grooved so that they would stand by themselves, providing a more effective display.

Work also continued on the *Sky Flyer* during this period so that a sample copy could be displayed at the conference. After preparing the sample, the committee decided to make the bulletin a continuing project as long as there were information and news to report. They also decided to include in the bulletin some letters that had not yet been returned.

Finally, the students put the finishing touches on their posters--gluing down edges, stapling last minute pictures, completing lettering--and discussed the setup at the conference site at another school. They decided to put the poster display in the reception area where the parents would get coffee. That way the parents would be sure to see the display and have time to look at it.

The students also discussed the entire unit with each one explaining and describing his/her project. They also discussed the things they had learned about one another--one was a good speller, one drew graphs well, one wrote good letters, one could draw well.

On the day of the conference the students went to the conference site and set up their display. There were sixteen different posters and seven of these had information on both sides. The information included--

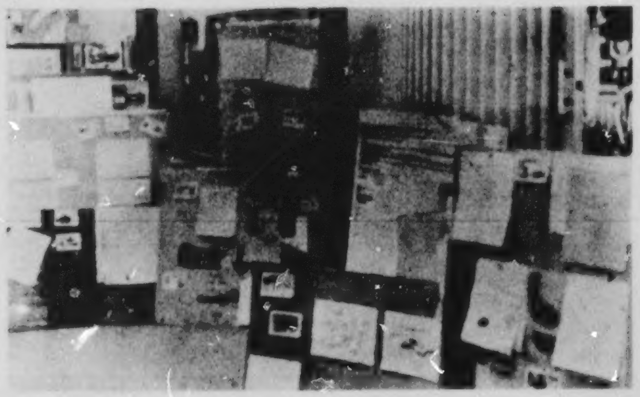
- letters sent and replies received
- drawings of the inside and the outside of school buildings
- a sample of the *Sky Flyer*
- pictures of the students working on the challenge
- graphs of information about students received from other classrooms

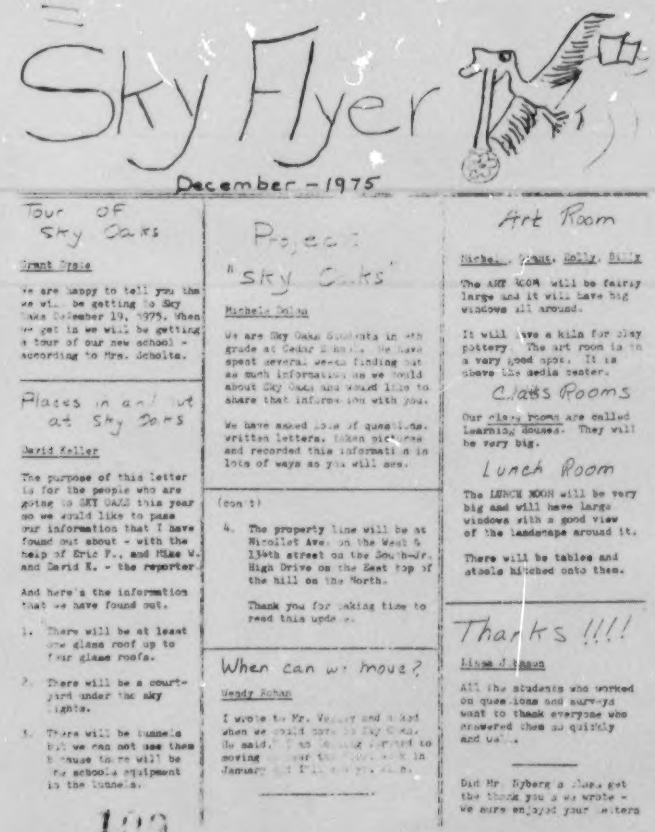
In addition, the students set up a slide projector to show slides that I had taken of the school under construction.

At the conference many parents enjoyed the display and expressed added interest in Sky Oaks because their children had so much to say about it that was current and interesting. Many also explained that their children had taken on added responsibility at home either for their tasks or for their actions. Most of the parents of my students said their children were looking forward to the move because they knew what was expected of them and what the school would be like.

After the conference the students discussed what they had learned. They definitely felt that they had succeeded in their challenge--they really knew a lot about their new school and about the people who would be there, both students and teachers. They especially mentioned that they were now accepting more responsibility for performing tasks at home.

Work continued for several weeks on the *Sky Flyer*. The group finally chose the front page (see Figure C2-7) and the color for the cover (by opinion survey). Having chosen me to type the text, they completed the first edition, which was fourteen pages long with six pages of pictures showing the class working on the unit. They also included students' and teachers' comments and a drawing of the learning centers. They assembled sixty copies and sent one to each school in which Sky Oaks students were being housed, one to each Sky Oaks teacher, and one to the parents of each Sky Oaks student. All agreed that it had been hard work, more than they had originally thought. Thus, the *Sky Flyer* finally went out, two months after it had been started.





Sky Flyer

December - 1975

Tour of Sky Oaks

Grant Dysle

We are happy to tell you that we will be getting to Sky Oaks December 19, 1975. When we get in we will be getting a tour of our new school - according to Mrs. Scholte.

Places in and out at Sky Oaks

David Keller

The purpose of this letter is for the people who are going to SKY OAKS this year so we would like to pass our information that I have found out about - with the help of Eric F., and Mike W. and David K. - the reporter.

And here's the information that we have found out.

1. There will be at least one glass roof up to four glass roofs.
2. There will be a court-yard under the sky lights.
3. There will be tunnels but we can not see them because there will be the schools equipment in the tunnels.

Project "Sky Oaks"

Michele Dolan

We are Sky Oaks Students in 4th grade at Cedar School. We have spent several weeks finding out as much information as we could about Sky Oaks and would like to share that information with you.

We have asked lots of questions, written letters, taken pictures and recorded this information in lots of ways as you will see.

(con't)

4. The property line will be at Nicollet Ave. on the West & 136th street on the South—Jr. High Drive on the East top of the hill on the North.

Thank you for taking time to read this update.

When can we move?

Wendy Rohan

I wrote to Mr. [illegible] and asked when we could move to Sky Oaks. He said, "I am looking forward to moving [illegible] in January [illegible]

Art Room

Michele, Grant, Holly, Billy

The ART ROOM will be fairly large and it will have big windows all around.

It will have a kiln for clay pottery. The art room is in a very good spot. It is above the media center.

Class Rooms

Our class rooms are called Learning Houses. They will be very big.

Lunch Room

The LUNCH ROOM will be very big and will have large windows with a good view of the landscape around it.

There will be tables and stools hitched onto them.

Thanks !!!!

Lisa Johnson

All the students who worked on questions and surveys want to thank everyone who answered them so quickly and well.

Did Mr. Nyberg's class get the thank you's we wrote - We sure enjoyed your letters

Figure C2-7

3. LOG ON ORIENTATION

by Florence Duncan*
Ernest Horn School, Grade 6
Iowa City, Iowa
(August 1974-November 1974)

ABSTRACT

These sixth-grade students began their investigation of the Orientation challenge with the introduction of two new students to the class and a discussion of the problems of moving to a new school. They worked on the challenge three to five days per week for a period of four months. The children were challenged to find ways to tell new students and parents about the Horn School. The class drew up a list of possible difficulties which new students might face. Parents and students were surveyed to determine the orientation needs of the group; this information was tabulated, graphed, and interpreted before action was taken. Suggestions were offered as possible solutions to the problems raised by the students and parents, and groups were formed to work on these suggestions. Action on the challenge included the distribution of an information booklet on the school and a booklet of new student write-ups, the preparation of a slide/tape show about the school program, a school map, and an orientation meeting for new students and their parents.

My social studies class began its investigation of the Orientation challenge when I introduced two new students to the rest of the class. An informal discussion was held on the problems of moving to a new school, city, state, or country. I encouraged the children to share their own experiences with the group: two students born in another country had come to the United States at a very young age; others had visited foreign countries and had experienced difficulties with the languages. At the end of the discussion I asked the children to summarize the main problems of moving to a new place. Their list included (1) finding new friends, (2) finding your way around the neighborhood and city, (3) getting adjusted to a new school, and (4) different ways of speaking.

My students and I focused on one item of our list during our next USMES session: the problems involved in adjusting to a new school. The class drew up the following list of possible difficulties in adjusting to a new school:

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*Edited by USMES staff

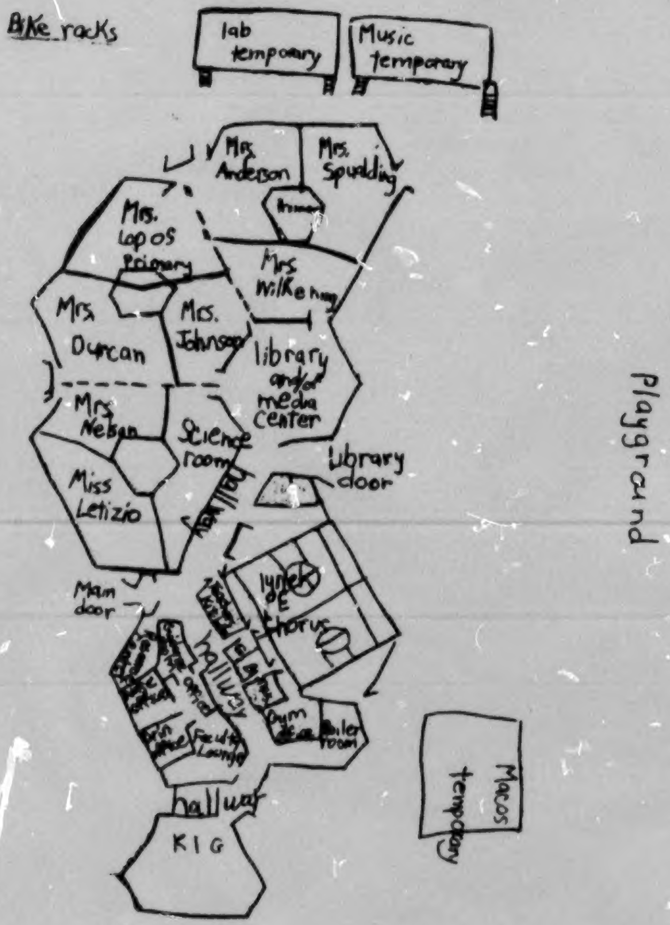
Bike racks
lab temporary
Music temporary
Mrs. Anderson
Mrs. Spudding
Mrs. Lopos Primary
Mrs Wilkening
Mrs. Duncan
Mrs. Johnson
library and/or media center
Mrs Nelson
Science room
Miss Letizio
hallway
Library door
Main door
E Chorus
hallway
Gym
Boiler room
Faculty Lounge
hallway
KIG
Macos temporary
Playground

Figure C3-1

1. different building plan
2. different way of learning or teaching
3. different rules
4. finding classrooms
5. class schedules
6. lunchroom and playground procedures
7. meeting teachers and classmates
8. different kind of reporting system

The last item sparked a lively discussion of difficulties that parents had in understanding differences between schools and how this, in turn, affected the children as they tried to explain new procedures at home.

The children offered several suggestions to solve the problems they had designated:

1. explaining the program
2. conducting tours of the building
3. choosing "buddies" for new students
4. preparing a booklet for new students
5. holding a class meeting before school starts

The remainder of the session was spent discussing these five suggestions.

Before the next class session I wrote the challenge, "Find ways to tell new students and parents about the Horn School," on the board. Four committees were formed with the task of brainstorming ideas or collecting information. The committees and their initial activities are listed below:

1. Primary classes--six students visited classes to observe general classroom setup, check schedules, etc.
2. Building layout--students obtained several copies of a floor plan of the building from the principal, then toured the school to draw in the temporary classrooms.
3. New students--students asked the principal how he learned about new students and listed questions to ask new students.
4. Parents--students discussed ways to collect information on what parents would like to know about the school, decided to write interview questions.

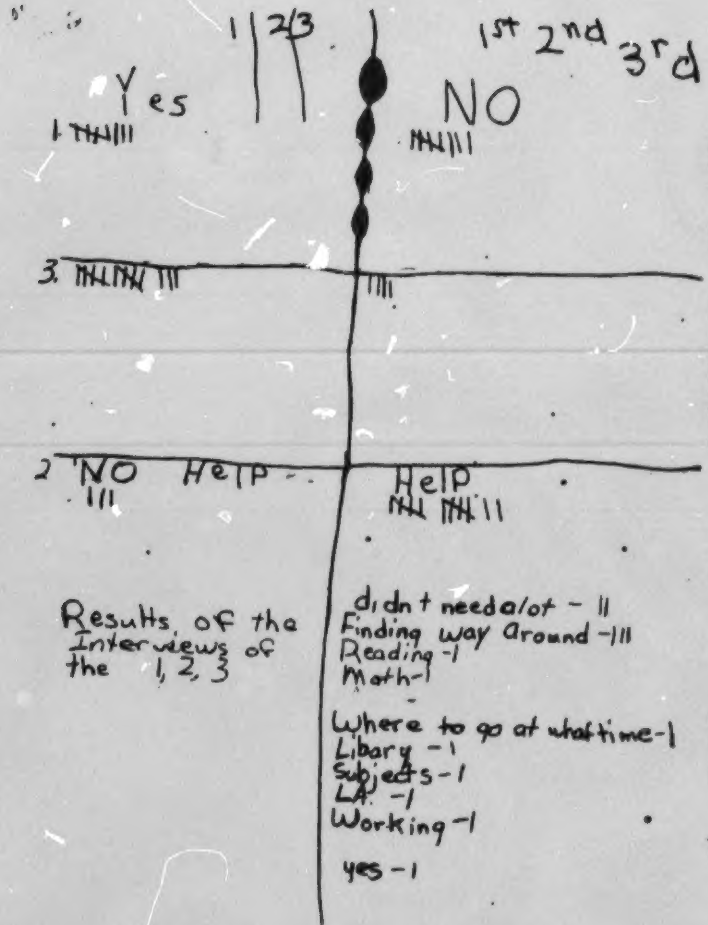

Figure C3-2

At a full class session several days later, the entire group focused its attention on developing interview questions for parents. Each child was asked to copy the question below and use it to interview their parents.

> If your child was a new student at Horn School, what would you like to know more about?

- a. schedules
- b. math
- c. language
- d. science
- e. spelling
- f. interest centers
- g. social studies
- h. where things are in school
- i. music
- j. library
- k. art
- l. physical education

The children spent the next session working in their groups planning what information was needed from the interview and how they would deal with it when it was collected. In reference to one interview question formulated by a student, a classmate asked, "That may be an interesting question, but what are we going to do with the information?"

Group work continued during the next few sessions. The building layout committee made a master copy of their map (see Figure C3-1) and continued writing descriptions of the uses of the different rooms. The new student and primary committees met and decided on the interview questions listed below. A typed master was prepared and forty copies were made for committee members to use.

1. When you first came to the Horn School did you have any trouble finding your way around?
2. What kind of help did you need when you first came to the Horn School?
3. Do you think you would like to come to school with your parents to meet the teachers and find out more about school?

One sample interview tally sheet can be seen in Figure C3-2: thirty-four new students were interviewed.* Members of the parent committee tabulated the last of the parent interviews

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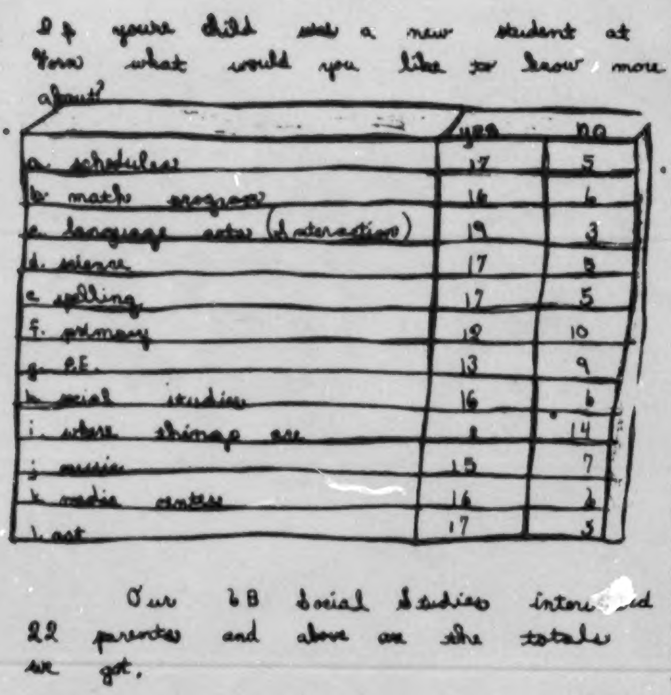
*The students might practice their interview questions with their classmates to find out whether they were getting the information they wanted and whether it was in a form that was easy to handle.—ED.



If youre child was a new student at Horn what would you like to know more about?

	yes	no
a. schedules	17	5
b. math program	16	6
c. language arts (interaction)	19	3
d. science	17	5
e. spelling	17	5
f. primary	12	10
g. P.E.	13	9
h. social studies	16	6
i. where things are	8	14
j. music	15	7
k. media center	16	6
l. art	17	5

Our 68 Social Studies interviewed 22 parents and above are the totals we got.

Figure C3-3

that had been returned and prepared a chart to represent their data.* (See Figure C3-3.) A presentation by the Map Group resulted in some heated discussion concerning the placement of walls as well as the shape and size of the temporary classrooms.

When the information was collected and tabulated, a class discussion was held to formulate ideas on ways to meet the challenge. Using the overhead projector, I listed all the suggestions on the board:

1. meeting for parents and new students
2. map of building
3. booklet of new student information
4. newspaper of new student information
5. slide show explaining the Horn School
6. write-ups of new students--their hobbies, where they came from, etc.

The children discussed each item, suggesting that some could be combined. The following day the children selected groups in which to work. Committee projects included organizing a meeting for parents and new students, producing a slide show explaining the Horn School program, preparing a booklet of new student information, and compiling write-ups about new students. The write-up and booklet committees chose to work cooperatively since their projects were so closely related. From this point the four groups worked simultaneously but, for the most part, separately, except for interactions during class discussions. When work was completed by one committee, its members joined other groups. For clarity I will report the activities of each group separately.

At the beginning of the next session, the group planning the meeting for parents and new students reported that their meeting would be limited to new students in the intermediate grades and their parents. Their rationale was that including material on the primary classes would make the meeting too long. This announcement prompted quite a lively debate. The three other committees were planning to include information on the primary classes: (1) slides of primary students, (2) write-ups of new primary-grade students, and questions   write-up group

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*The students might be asked to find a way to make the data easy to understand. They might make a bar graph of the "yes" answers and use the information to determine emphasis or order in the booklet or slide show.—ED.

1. Where did you come from?
2 What school did you go to?
3 Was your school anything like this?
4 What is your favorite sport and hobby?
5 How oldare you?
6 What grade are you in?
7 What is your teachers name?
8 Where do you live?

Figure C3-4

Emily Hughes

① Cedar Rapids
② Grant Wood
③ yes
④ jumprope, making pictures
⑤ 6
⑥ don't know
⑦ 1st
⑧ Mrs Lopas

Write-ups

Emily Hughes is 6 years old and in first grade. Her teachers name is Mrs Lopas. She use to go to Grant Wood, and her school was like Horn. She likes to play jumprope and make pictures She use to live in Cedar Rapids

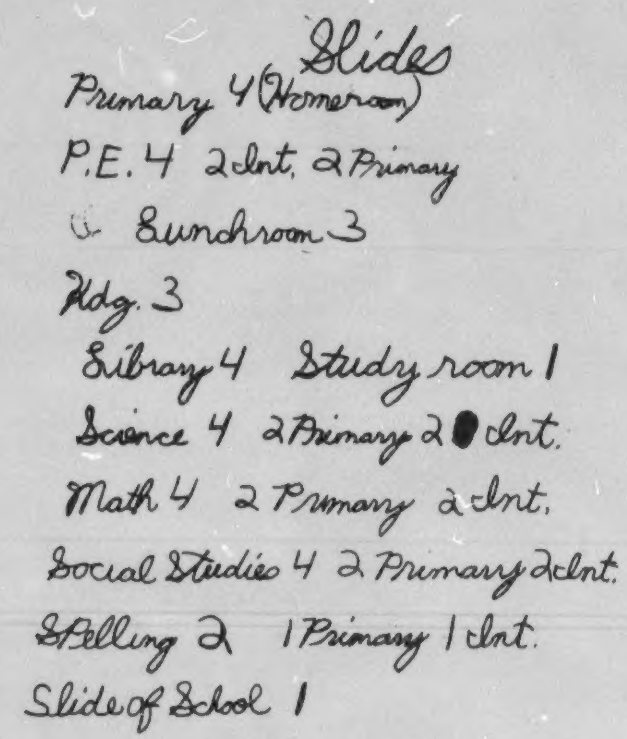
Figure C3-5

(3) information on the primary classes in the booklet. Several students suggested ways to deal with controlling the length of meeting and still include the primary students. One suggestion was to begin the meeting with a joint discussion followed by group meetings on the two programs—primary and intermediate.

Write-up Group

The committee compiling write-ups on new students arranged times for interviews after they had formulated their interview questions. (See Figure C3-4.) A write-up was prepared and read to the committee members for suggestions and comments. A sample write-up can be seen in Figure C3-5. The children in this committee worked steadily on their project and produced a six-page typed booklet of information on new students. The committee members explained the proposed organization of their booklet: write-ups were grouped according to the student's homeroom teacher, and the names of the teachers were in alphabetical order. The class agreed with the opinion of the committee members that the write-up booklet should be kept separate from the information booklet. Additional time was spent exploring ways to have the booklet reproduced.

The children decided to have their material typed on masters and run off on the school duplicating machine. They talked with the principal who said that he would donate the masters and charge us for the paper only, a cost of $4.50. They wanted to have 175 copies made to be distributed to every family in the school. (A distribution of one per family is common at our school. The copy is given to the oldest Horn School student in each family.) I had thought that the copies would be distributed at the New Students/Parents Meeting and asked committee members for the rationale behind their decision. The students replied that their project was designed to introduce new students to the school, hence, the write-ups should go to everyone. Since the meeting was primarily for new students and their parents, the write-ups would not reach all of the families. Shortly after the committee finished its work, two new primary students joined the student body of the Horn School. Rather than add pages to the booklet which was already prepared, the children decided to include the write-ups in the newsletter for parents. The booklets were distributed in each homeroom following a prepared speech delivered by a committee member.



Slides

Primary 4 (Homeroom)

P.E. 4 2 Int. 2 Primary

Lunchroom 3

Kdg. 3

Library 4 Study room 1

Science 4 2 Primary 2 Int.

Math 4 2 Primary 2 Int.

Social Studies 4 2 Primary 2 Int.

Spelling 2 1 Primary 1 Int.

Slide of School 1

Figure C3-6

Slide/Tape Show Group

Members of the slide show committee spent much time deciding on the slides to be taken, as well as determining who would take them. A slide show had been produced the year before, and there was a heated discussion on how many of the old slides should be included in the new program. During the next session the children took twelve slides in different parts of the school and then returned to the room where they joined other committees until they could resume their committee activities. At an earlier session the group had decided to take a total of forty slides to be used at the New Students/Parents Meeting; a partial listing of the slides to be taken may be seen in Figure C3-6. A company offering twenty-four-hour processing service was selected to develop the slides. Of the first slides developed, eleven did not come out at all, and many of the others were too dark to use. A photographer visiting the school soon after the first slides were returned gave the children some welcome advice on taking slides.

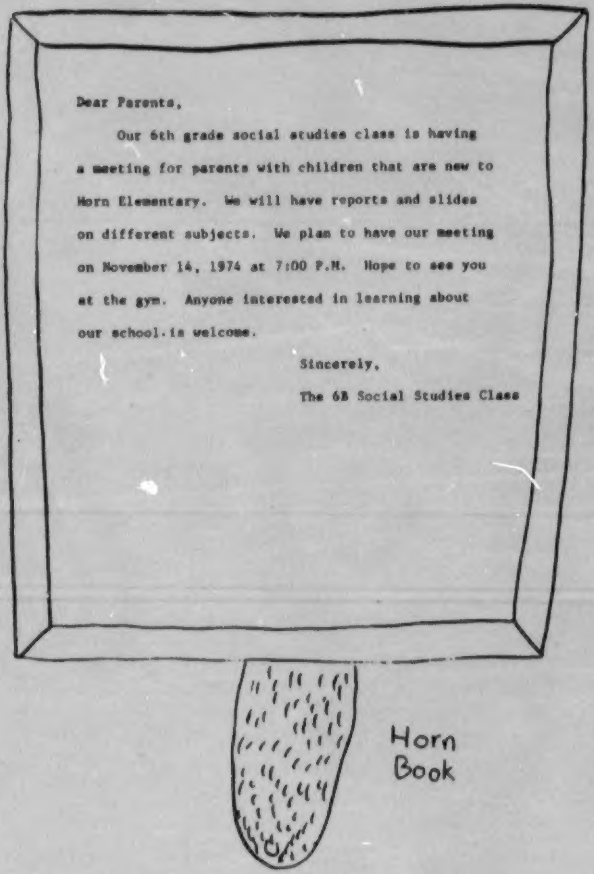
During the next class session the slide committee showed the slides they felt were usable to the rest of the class. Their classmates felt that many of them were unacceptable because of technical reasons or content, and they decided that additional slides had to be taken.

Several sessions later, while attempting to coordinate the slides with written material on the school program, the students observed that the two did not correspond. They decided to exchange notes and to coordinate the remaining slides to be taken with the written material. As the committee made decisions on which slides to include, the children viewed the slides and commented on them. Members of the slide committee met to order the existing slides and to designate those that still had to be taken.

During the meeting we discussed some of the problems they had been having: (1) each person feeling possessive about the slides he/she had taken, thus, reducing their objectivity and slowing down the selection process; (2) lack of coordination of slides when two or more children shared responsibility for photographing an area; and (3) more concern with having equal numbers of turns with the camera or slide projector than with producing a slide show.

New Parents' Meeting Group

The committee working on information for parents concentrated on writing up various parts of the Horn School program. Based on the results of the parent interviews, the



Dear Parents,

Our 6th grade social studies class is having a meeting for parents with children that are new to Horn Elementary. We will have reports and slides on different subjects. We plan to have our meeting on November 14, 1974 at 7:00 P.M. Hope to see you at the gym. Anyone interested in learning about our school is welcome.

Sincerely,

The 6B Social Studies Class

Figure C3-7

following areas were selected to be discussed during the meeting:

1. language arts
2. art
3. science
4. social studies
5. math
6. physical education
7. music
8. library
9. schedules
10. spelling

The students on the committee felt that interspersing slides with dialogue would make an effective presentation. As the written presentations were completed, they were read to the entire class. Their classmates offered constructive criticism that focused on the way the material was presented and on minor changes in syntax. During the same session one member presented the committee's proposal for an invitation (see Figure C3-7). The class approved the idea and spent some time discussing ways to prepare a master to duplicate the required number of copies.

Two members of the meeting committee met with the Parent Advisory Council to outline the class's plans for the New Students/Parents Meeting and to find out the plan of the Advisory Council for fall meetings. The next day they reported to the class on the meeting. Several council members expressed interest in the project and felt that many parents who were not new to the school would also like to attend. They did not feel that the children's meeting should be part of the traditional Open House for the following reasons:

1. New parents would be lost in the crowd of people meeting in the gym.
2. There would not be sufficient time for both the students' presentation and browsing time in the classrooms.

The Advisory Council suggested that the sixth graders hold their meeting several weeks after the Open House.

When committee members finished their report, the class discussed the pros and cons of holding our meeting before or after the Open House. Some of their reasons are listed below:

1. Our meeting will insure that new parents will be familiar with the school when they come to the Open House--the new students won't have to try to explain the new program.

2. Parents won't come to our meeting if it is held after the Open House--"They'll think a meeting planned by sixth graders won't be any good."
3. If we wait until after the Open House, a lot of our information will be out of date, for example, that on current art projects.

Several students volunteered to speak with the principal about delaying the Open House until November. The student representatives were advised to direct their request to the Parent Advisory Council. The chairman of the program (meeting) committee got in touch with the president of the Parent Advisory Council and delivered the class's request. He said that he would consider the postponement but was not convinced that it was a good idea.

Several days later the children learned that the Parent Advisory Council had decided to hold its scheduled October 28 Open House. They conveyed this in a note being sent home with students before I was able to tell them of the decision myself. They were extremely disappointed, but after some discussion they decided to choose another date for their meeting. A class vote was taken after several alternative dates were suggested; two members of the meeting committee volunteered to reserve the new date, November 14, with the principal.

Members of the meeting committee continued to meet and work together. Several students explored the possibility of using video equipment to prepare parts of their presentation. Others prepared invitations to the meeting; these were distributed in homeroom classes a week before the November 14 meeting. As the date approached, students on the committee attended to such details as finding a lectern, determining the necessary numbers of chairs and tables (with the help of the custodians), and determining the number of name tags to have on hand.

Booklet Group

Students on the booklet committee met early in the course of the unit to discuss the possible length of the booklet and to confirm writing assignments for its preparation. The children agreed to limit the length of each write-up on different subjects and special areas to one paragraph. During a class discussion the children determined the topics to be covered in written form in the booklet and in oral form at the scheduled meeting. Booklet topics are listed below:

1. supply list
2. rules
3. social studies
4. art
5. science
6. language arts and spelling
7. staff list
8. map of school
9. music
10. math
11. library

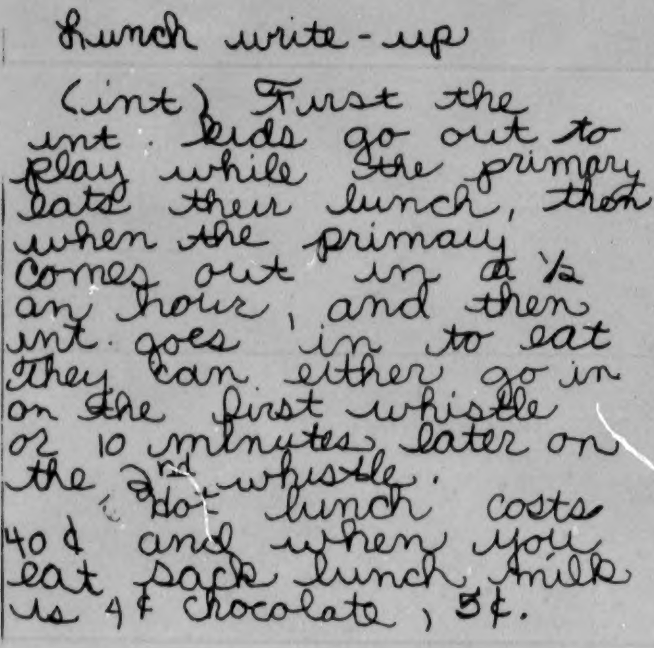
Several sessions later the booklet committee discussed ways of having the booklet reproduced. Copies are to be distributed to the new parents at the evening meeting. Additional copies will be given to new students entering the school at mid-year. Initially, committee members proposed bringing typewriters to school and typing the material themselves on ditto masters; however, the children conceded that they were not sure that they could do this. I asked them to consider alternatives and showed them samples of booklets which were reproduced by the Iowa City School System and the Joint County System. The children responded very positively, each choosing one of the following methods to investigate: (1) library Xerox machine, (2) Joint County Printing Office, and (3) Iowa City School System Printing Facility.

During discussions held later in the week members of the booklet committee presented some of their preliminary findings to the class. They did not know the number of pages to be included in the booklet and, therefore, were unable to determine the exact costs for each method for printing 100 booklets. Four classmates volunteered to join the booklet committee to investigate printing alternatives and costs.

A class meeting was called to resolve the question of printing the booklets. During the meeting the students who had been collecting data on the different alternatives presented their findings. After lengthy class discussion all but three methods had been eliminated, and the class agreed to select one of the following methods by taking a vote:

1. Union Hospital--$15.00
2. Iowa City School District--$6.00
3. Horn School--$6.00

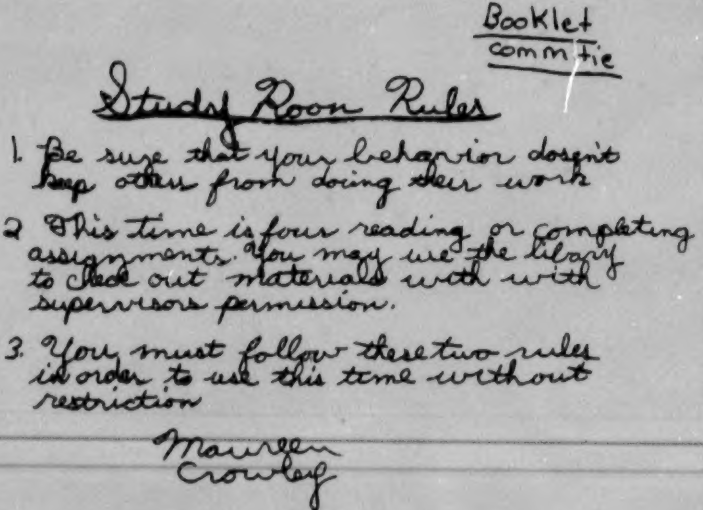
The Iowa City School District was chosen by a majority of students to reproduce the booklet. Children reasoned that it was cheaper than printing it at Union Hospital and, based on samples seen by the class, would look more like "real" printing than that reproduced at the Horn School. This brought printing costs for both the new student write-ups and the Horn School booklet to $10.50 ($4.50 + $6.00).



Lunch write-up

(int) First the
int. kids go out to
play while the primary
eats their lunch, then
when the primary
comes out in a ½
an hour, and then
int. goes in to eat
They can either go in
on the first whistle
or 10 minutes later on
the 2nd whistle.
Hot lunch costs
40¢ and when you
eat sack lunch milk
is 4¢ chocolate, 5¢.

Figure C3-8



Booklet
commtie

Study Roon Rules

1. Be suze that your behavior doesn't keep others from doing their work
2 This time is four reading or completing assignments. You may use the libary to check out materials with with supervisors permission.
3. You must follow these two rules in order to use this time without restriction

Maureen
Crowley

Figure C3-9

The class discussed the following ways of raising the necessary funds:

1. everybody bring in $.50
2. have a bake sale
3. have a white elephant sale

The bake sale was the unanimous choice of the class.

The booklet committee did have organizational difficulties which I attribute to the leadership within the committee. Materials were misplaced several times, typing was slow, and the children showed signs of losing interest. In spite of this, the group did produce an excellent booklet about the Horn School. Members of the committee read their write-ups to the class as their drafts were completed. Examples of their work can be seen in Figures C3-8 and C3-9. Their classmates offered constructive criticism--in some instances articles were completely rewritten on the basis of peer comments. Printing deadlines necessitated locating a parent volunteer to type first a rough draft and then a final copy of the booklet. The entire class helped proof the final copy.

The two students who prepared a scale drawing of the school to be included in the booklet experienced several difficulties while working on their project. They worked from an existing map of the school that had been prepared several years earlier. During one class session one of the students reported to the class that the scale indicated on the map was incorrect; he felt that additional measurements had to be taken before the correct scale could be determined.

To assist them in their task, I held a skills session on the method of determining the scale from a drawing or sketch. We discussed taking the actual measurements of a wall in the sketch, comparing it with the scale drawing, and determining the ratio in lowest terms. The students involved in this wanted to expand this idea and take measurements of several areas. They used the "How To" Cards making a drawing to scale to do this. In the process one student discovered the error: the scale was listed on the map as 1/16 inch ↔ 1 foot but should have been 1/16 ↔ 2 feet, 1/2 inch.* In addition to correcting the scale on the map, he prepared a lengend for the drawing, measured our three temporary buildings, and added them to the drawing using the correct scale. A copy of the school map which appeared in the booklet can be seen in Figure C3-10.*

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*Most likely the scale was listed incorrectly and probably should have been 1/32 inch ↔ 1 foot so that the student is remarkably close.--ED.

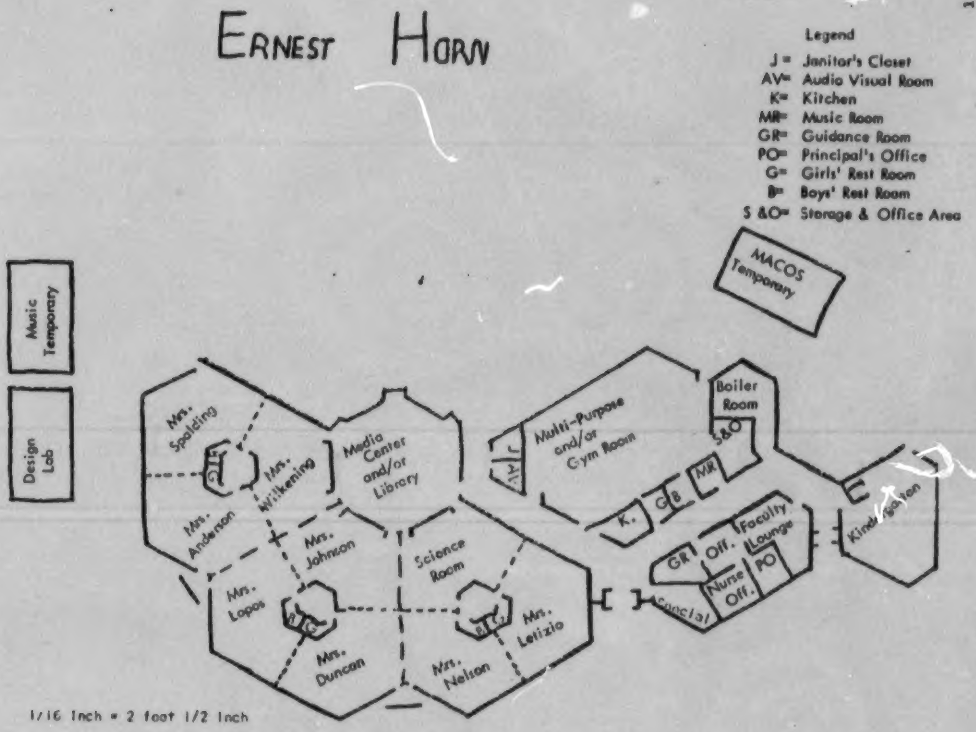
ERNEST HORN
Legend
J = Janitor's Closet
AV= Audio Visual Room
K= Kitchen
MR= Music Room
GR= Guidance Room
PO= Principal's Office
G= Girls' Rest Room
B= Boys' Rest Room
S &O= Storage & Office Area
MACOS Temporary
Music Temporary
Design Lab
Mrs. Spalding
Mrs. Wilkening
Media Center and/or Library
Multi-Purpose and/or Gym Room
Boiler Room
S&O
MR
G
B
K
AV
J
Faculty Lounge
Off.
GR
PO
Nurse Off.
Kindergarten
Mrs. Anderson
Mrs. Johnson
Science Room
Mrs. Lopos
Mrs. Letizio
Mrs. Duncan
Mrs. Nelson
Special
1/16 Inch = 2 foot 1/2 Inch

Figure C3-10

During the next class session the students decided on the title and credits for the booklet. It was to be "Get to know Ernest Horn" by 6B Social Studies. Members of the

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*If time is available, the students might construct a map or model layout which can be placed in the school lobby or in the school office.--ED.

CONTENTS	
Map	page 1
Staff	page 3
Supply List	page 5
Schedules	page 6
Music	page 16
Band	page 16
Chorus	page 16
Kindergarten	page 17
Media Center	page 17
Orchestra	page 17
Rules	page 18
Social Studies	page 18
Science	page 19
Language Arts	page 20
Art	page 21
Spelling	page 21
Lunch	page 21

Figure C3-11

booklet committee voted to have a green booklet with yellow pages. Once the printed copies were complete, they had to be collated and stapled by the class. The children did this the day of the meeting and also verified the page order of each of the 103 copies. (A copy of the table of contents of the book can be seen in Figure C3-11.) Members of the slide committee and meeting committee showed the slide presentation to the faculty on the day of the meeting. Two boys spent several hours on the day of the meeting in the Design Lab wiring a small lamp and attaching it to the lecturn for the program.

We ended the day with a quiet discussion of plans for the evening meeting. People were chosen to hand out booklets and name tags, run the projector, operate the lights, and participate in the question-and-answer period. The class met in the school gym at 6:00 P.M. to do a "run-through" of the program. The children helped the school maintenance crew set up the room for the meeting; this included chair and table placement and setup of audio-visual equipment.

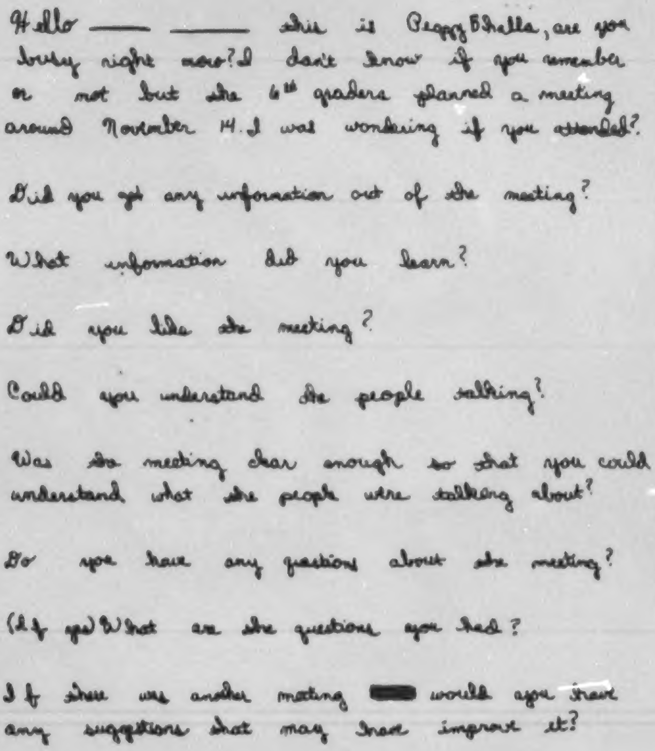
As parents arrived for the meeting, they were given a name tag and a booklet and were asked to wait in the library while the final rehearsal was completed. Once the parents were seated in the gym, I welcomed them and explained that the program they were about to see was planned and prepared by the students as one solution to the problem of getting both new students and their parents acquainted with our school. Attendance was approximately sixty, including children who accompanied parents, as well as some parents of members of the orientation class.

The show went very smoothly. It sounded as if the children had been rehearsing for weeks. After the presentation in the gym was completed, we all adjourned to the library for refreshments. During this time, a videotape on some of the language arts projects was shown. (This had been taped earlier by the librarian.) The children had agreed that this portion of the school program was of great interest to the parents.

Most of the children stayed to clean up the kitchen and clear the gym, but we were all out of the school by 9:00 P.M. Two weeks later, the class held a bake sale to pay for the printing expenses that were incurred in the course of the unit--a total of $13. They cleared $33 and contributed the excess of $20 to the sixth-grade musical scheduled for later in the year.

Several weeks after the bake sale, in an effort to bring closure to the unit, the children decided to evaluate the effectiveness of the meeting. During a class discussion the students developed a telephone survey of nine questions to be given to new parents who had attended their meeting. The survey sample consisted of eight new families. A sample of the questionnaire and answer sheet can be seen in Figures C3-12 and C3-13. When the answer sheets were completed, a group of four students made a chart of the answers on an overlay which could be shown on an overhead projector. A copy of the student chart can be seen in Figure C3-14. It was shown during an afternoon class discussion. From the chart the class concluded that most of the people interviewed had understood the purpose of the meeting and had gained some useful information. One of the student callers noted that the people with whom she had spoken were very complimentary.

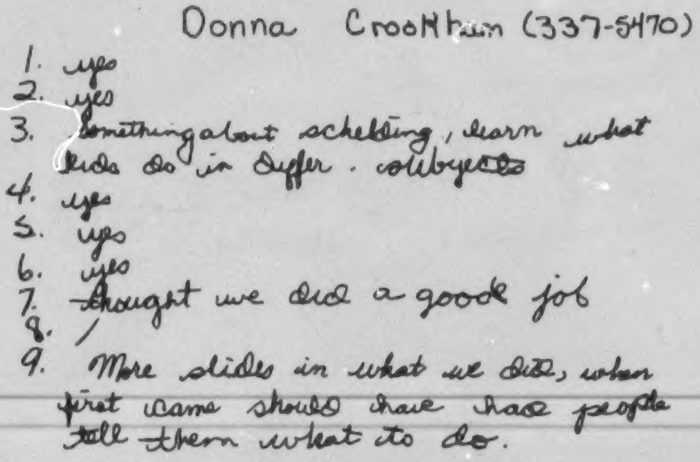
Before ending the unit, we discussed whether or not this type of unit should be done earlier in the year. The children agreed that there simply is not enough time to organize everything by an earlier date. Later in the school year, members of the Horn School staff used the slide/tape show during Kindergarten Round-Up as a means of explaining the school program to the parents of new kindergarten students.



Hello ____ ____ this is Peggy Bhella, are you busy right now? I don't know if you remember or not but the 6th graders planned a meeting around November 14. I was wondering if you attended?

2. Did you get any information out of the meeting?
3. What information did you learn?
4. Did you like the meeting?
5. Could you understand the people talking?
6. Was the meeting clear enough so that you could understand what the people were talking about?
7. Do you have any questions about the meeting?
8. (If yes) What are the questions you had?
9. If there was another meeting [redacted] would you have any suggestions that may have improve it?

Figure C3-12



Donna Crookham (337-5470)

1. yes
2. yes
3. Something about scheduling, learn what kids do in differ. subjects
4. yes
5. yes
6. yes
7. thought we did a good job
8. /
9. More slides in what we did, when first came should have had people tell them what to do.

Figure C3-13

	Mrs Nolan	Mrs Clarke	Mrs. Rogers	Mr. Reidman	Mrs. Hughes	Mrs Crookha	Mrs Hagan	Mr Duffner
①	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
②	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes.
③	The way the system worked	schedules teachers lunch room	How the school works	What went on at at Horn	Learned of structure of building	scheduling	None	learned of structure of building
④	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
⑤	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
⑥	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
⑦	no	no	no	no	no	no	no	no
⑧	None	None	None	None	None	None	None	None
⑨	None	Video tapes hard to hear	None	Hard to see video tape	Earlier in year	More slides no hostesses	none	Better video tape

Figure C3-14

4. LOG ON ORIENTATION

by Sherry Malone*
Hilsman Middle School, Grade 8
Athens, Georgia
(December 1973-May 1974)

ABSTRACT

This class of eighth-grade students worked on orienting incoming students to their school as well as orienting outgoing students to the local high school. During the first month they spent an hour each day working on the challenge and then reduced that to an hour and a half per week. The children collected measurements of the school building for a school map and surveyed students in their own school as well as the high school to determine orientation needs. The results of the surveys were tabulated, graphed, and analyzed before any action was taken. Action on the challenge included the development of a slide/tape show, orientation meetings, tours of the school, a newsletter for students preparing to enter the local high school, and a school handbook. Through additional surveys and questionnaires, several students also investigated the effects on people of moving to a new locale.

My class began work on the Orientation challenge with a discussion of the meaning of migration, its consequences, and the factors that cause people to move.** The students listed the following problems that might be faced by people who move to a new community:

1. no friends
2. not being accepted
3. speech
4. clothing or appearance
5. climate
6. customs
7. material possessions
8. activities
9. physical characteristics

---

*Edited by USMES staff

**The unit challenge at that time was, "Find ways to help newcomers to our community." Since then it has been broadened to include any new situation in which students might find themselves, not just situations they face when they move to a new community.—ED.

To begin the next session, I wrote on the board many of the better ideas about moving that the students had brainstormed. These included the following:

1. How many new students enter at various times of the year?
2. What is the effect socially on a thirteen year old?
3. What impacts must an individual face when he/she moves to a new community?
4. What problems exist when there is movement between schools, and how can these problems be eased?

As a class we talked about these and other ideas that had been suggested. We decided our ideas could be divided into three groups:

1. The effects of migration (social, economic, physical)
2. The reasons people have for moving
3. The needs newcomers to a community have and how they are met

At the beginning of the session I issued the challenge: "What are the most important problems that newcomers encounter, and what can the school and/or community do for newcomers?" We discussed how the three main areas that we had defined would relate to the challenge, and I asked the students to choose one of these areas for group work. From this time the three groups worked simultaneously, but separately, except for interaction during class discussions. For clarity, the activities of each group are reported separately.

There were ten members in the group concerned with identifying needs of newcomers and dealing with them. They began quickly to brainstorm ideas related to their area and listed the following:

Things to find out:

1. How moving affects a thirteen-year-old boy
2. How the needs of the family affect the time they move
3. Whether people who move from other parts of the country adapt readily to different foods

Things to do to help newcomers:

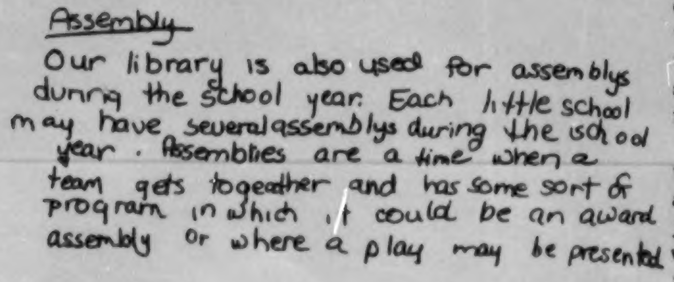
1. Have a slide show of school and teachers for incoming students
2. Make pamphlets, rule books, and a summary of what teachers have planned for each quarter
3. List textbooks that will be used
4. Have a group appointed to show newcomers where everything is
5. Have a map of school

They then tried to decide with what level of society (school, local, state, international) they should work, and, after much discussion, they decided on orientation of new students as their problem. One group felt a slide/tape show should be shown to incoming students, and another group decided they should investigate Cedar Shoals High School, to which the eighth grades would go next year.

Two members of the group started working on the slide/tape show by writing letters to two people they knew who had slides of the school, asking to borrow these. They spent a couple of hours going through the slides, deciding which they wanted to use, and then wrote to the owners asking to keep those slides for a while longer. They then telephoned a number of photography stores and discovered that it would be cheaper to take their own slides than to reproduce ones already made. They decided to take their own slides and telephoned to find the store that would give them the best price.

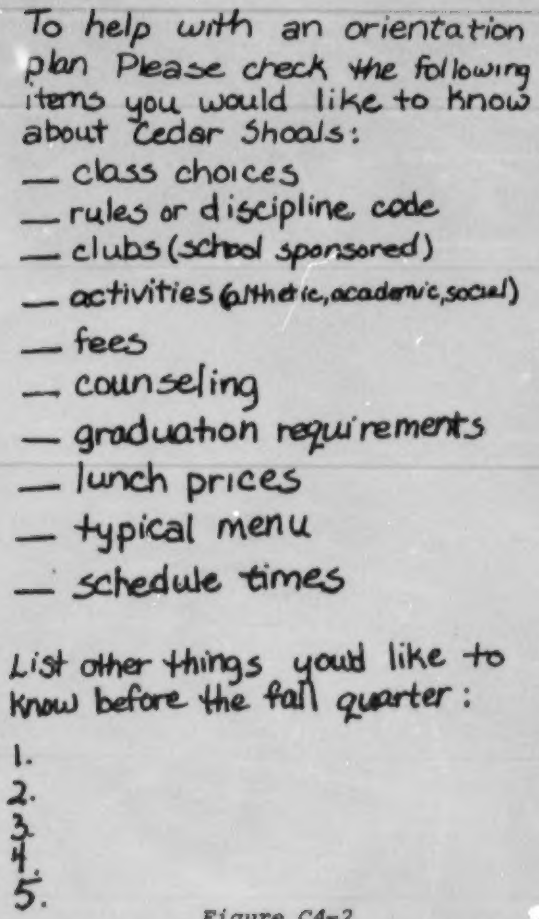
They obtained a camera and bought film and flash bulbs and began to make a list of the twenty slides they felt would be beneficial for sixth graders. When they took the pictures, they tried to photograph sixth graders as much as possible so that the incoming fifth graders could identify with them or recognize them and the sixth-grade teachers more readily. They were quite selective about their photographs and wouldn't take any when children were making "Black Power" and "Peace" signs because they had spotted the camera.

When the slides they had taken of the Middle School were developed, the children reviewed them and wrote down what should be said about each slide. They had thought to record students and teachers talking but hadn't been successful in this. The group found the writing of the script tedious and lost much of their enthusiasm. The script they wrote was not very interesting as it did little but say what the viewer



Assembly
Our library is also used for assemblys
during the school year. Each little school
may have several assemblys during the school
year. Assemblies are a time when a
team gets togeather and has some sort of
program in which it could be an award
assembly or where a play may be presented

Figure C4-1



To help with an orientation
plan Please check the following
items you would like to know
about Cedar Shoals:
— class choices
— rules or discipline code
— clubs (school sponsored)
— activities (altheric, academic, social)
— fees
— counseling
— graduation requirements
— lunch prices
— typical menu
— schedule times

List other things you'd like to
know before the fall quarter:

1.
2.
3.
4.
5.

Figure C4-2

could see, rather than really orient him. I suggested that they read it to some of the other students for their reaction. These reactions left little doubt that it "turned students off," not "on." The students reluctantly started rewriting the script.

After an evaluation of our work at a reporting session, the class decided that the slide/tape show was an important aspect of their work. Consequently several other students joined the group, and with this fresh talent the script-writing began to move again. The group decided to flash their slides on the wall and to have all the students pool their ideas about each slide. One person would take down the dictated final form. This was a very slow process, but gradually the script was written. Figure C4-1 shows an example of the script of one slide. After they had written the script, they put the slides in order.

During the script-writing, one student suggested that they sell their slide/tape show to the school and put the money in a fund for other such projects, but a more cautious student said, "Let's see how well we do first," and the idea was put aside.

When the script was written, the students corrected it for grammatical errors.

"You don't end a sentence with 'of.'"

"Why not?"

"Because it's a preposition!"

They then obtained a tape recorder and asked interested students to audition as readers. Four of their group wanted to read the script, and each was recorded while reading the section for one slide. The tape was given to a Language Arts/Speech teacher who didn't know who the speakers were. She chose the last speaker and gave advice about speech errors.

The recording of the tape proved difficult because twice the recording was spoiled by noise or interruptions, and we decided it would have to be recorded after school one day. The six students who were making the slide/tape show talked with the counselor, and it was decided that they would be responsible for visiting the three elementary schools which feed into Hilsman. They would introduce the slide/tape show, answer questions, and talk about other aspects of middle school life. The students were really delighted and proud of their new role.

While this group of children had been waiting for their slides to be developed, they decided to construct a map of the school for the benefit of incoming students. They

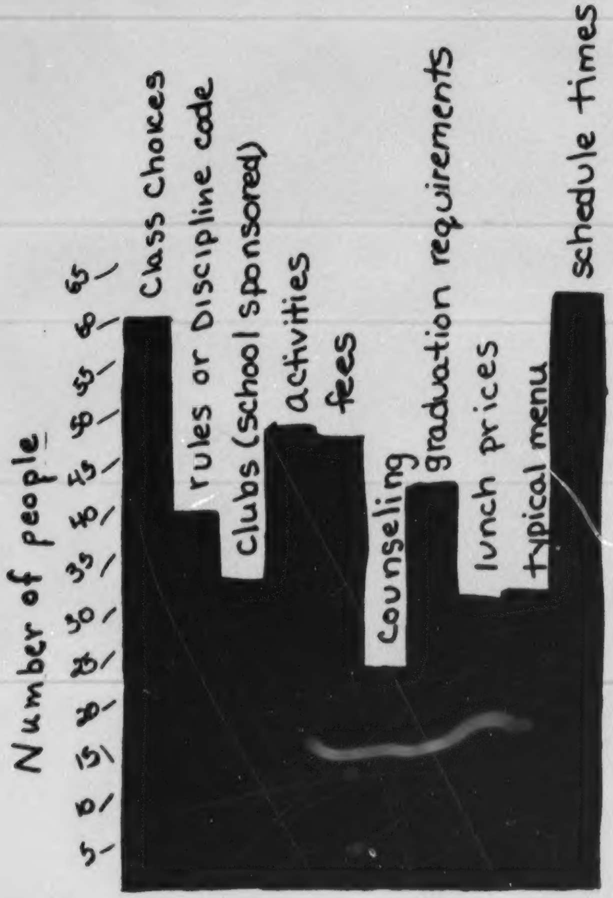


Figure C4-3

obtained a map of the school but decided it wasn't good enough. They tried to get blueprints of the school so that they could get accurate measurements, but these were not available. The children were informed "by the office" that there were fourteen feet between each beam in the building, but they soon discounted this idea as the number of concrete blocks between the beams varied. All alternatives exhausted, they set out to measure the building with a surveyor's tape measure. During the measuring the students decided to round off their measurements to the nearest foot. I asked them what problems might arise by doing this, and they mentioned several things such as, "if you were building this school, the walls might not touch." I asked how they could let the reader of their map know this limitation and they said, "Just say in the key, 'measurements to the nearest foot.'"

When the map was completed and shown to the class, other students complained that they could not follow it. There was discussion about whether it was best to put on the map room numbers (which are seldom used), teachers' names (which change), or the area. Some students thought the map was not correct, and the Mapping Group challenged these students to remeasure the building.

When this was done, it showed that the map was indeed inaccurate because the students had assumed the two wings of the building to be symmetrical and had measured only one wing. Also, two storage rooms had been left off the map. At this stage the original map makers gave up the job, and other students took over the redrawing of the map. This took a long time but was finally completed. When the map was acceptable, the students then faced the problem of reducing the map to fit into the Hilsman Highlights pamphlet.

Another subgroup decided to survey one-third of the present eighth-grade students to determine what they would like to know before going to high school. They wrote the survey, duplicated it, and were very efficient about distributing it and tallying the results. At first they intended to report their results as percentages of the total number in the survey and the total number of eighth graders, but they later changed their minds and looked at the "How To" Cards for ideas on graphs. After considering using scatter graphs, they decided bar graphs were more appropriate. A copy of both their survey and their bar graph are shown in Figures C4-2 and C4-3.

A girl from the group wrote a letter to the principal of Cedar Shoals High School requesting an interview to obtain material concerning orientation for ninth graders. They

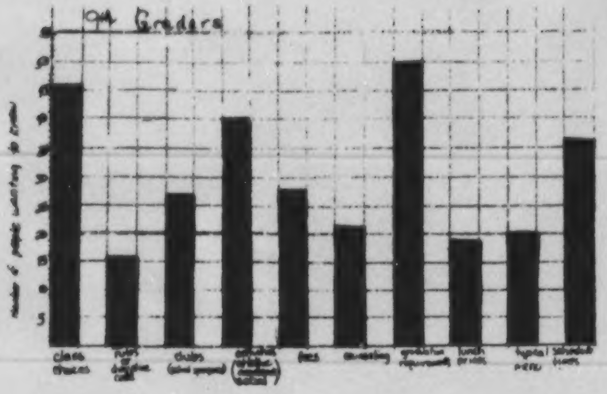
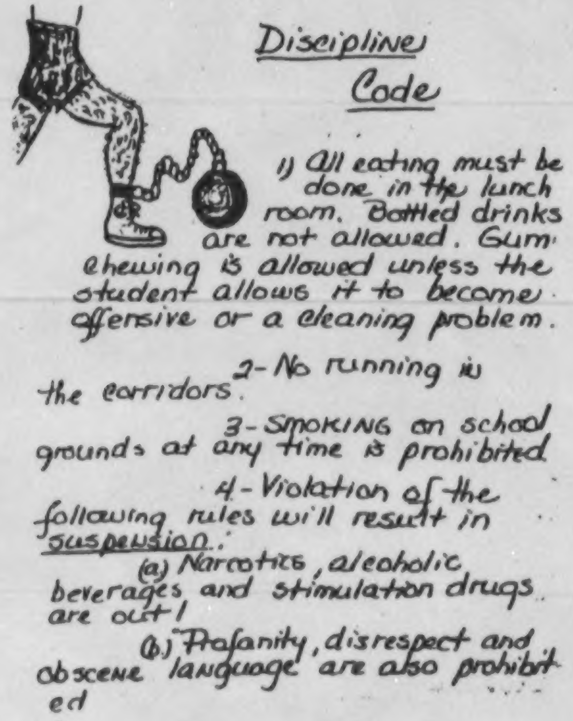


Figure C4-4



Discipline Code

1) All eating must be done in the lunch room. Bottled drinks are not allowed. Gum chewing is allowed unless the student allows it to become offensive or a cleaning problem.

2- No running in the corridors.

3- SMOKING on school grounds at any time is prohibited.

4- Violation of the following rules will result in suspension:

(a) Narcotics, alcoholic beverages and stimulation drugs are out!

(b) Profanity, disrespect and obscene language are also prohibited

Figure C4-5

found the principal very helpful in the interview, and he gave them a map of the school. Some other students wrote requesting permission to photograph the high school for a slide/tape show. As well as photographing scenes around the school, they also passed out a questionnaire to ninth graders to identify what activities, rules, etc., they would like to have known more about before entering high school. The questions were similar to those in the survey of eighth graders, and the results are shown in their bar graph in Figure C4-4.

After completing the surveys, the high school orientation group lost their direction and didn't get anything done for a while. The students said that they were bored and that the problem was that the high school already had a scale map of the school, an explanatory handbook, and a registration booklet, and they felt there was nothing else for them to do. They considered taking more photographs but had not yet done anything with the photographs they had taken earlier. They later decided to work on a newsletter for eighth graders to be posted in Hilsman Middle School.

Early in our work on Orientation, two boys in the group working on helping to fill the needs of newcomers decided to make a Hilsman Handbook for incoming students, planning to illustrate it and type it themselves. They divided the labor so that one wrote the text and the other illustrated it. They thought it should be called Hilsman Highlights with the school symbol of a panther on the cover. During a "project progress report day" the rest of the class discussed the pamphlet. One student felt that the dress code and attendance rules were "dreary." He suggested that they should add other things like a sample lunch menu and favorite neighborhood places to go. This provoked a likely debate as to whether there were any "places" to go. No agreement was reached, and the boys making the pamphlet said they would consider the suggestion. It was the unanimous opinion of the class that the names of the teaching staff should be omitted since staff changes occur from year to year, and, as one student said, "What does a new kid care?"

When the first draft of the handbook had been written and corrected, the students chose the illustrations to go with the text. They also started to figure out how much the pamphlet would cost to produce. They researched the cost of the paper from several local establishments and, on the basis of this, decided to change the size of the handbook to make better use of the paper. It seemed likely that the paper shortage would limit the number of copies they could

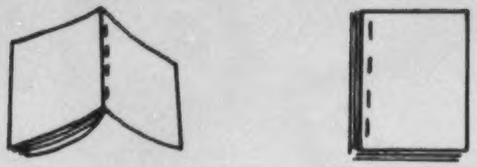
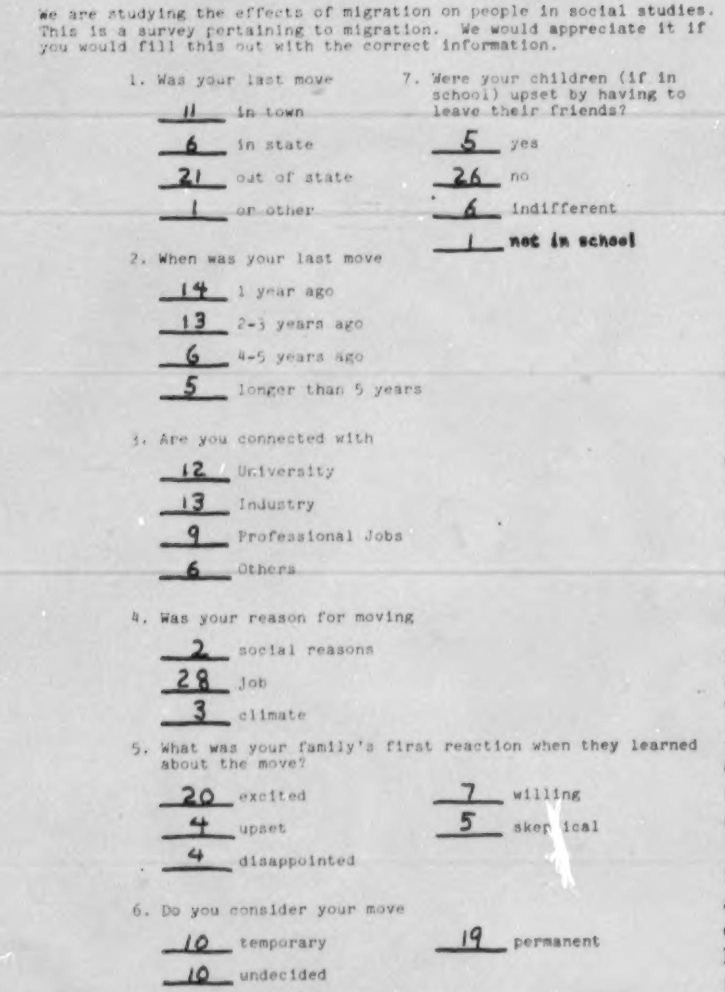


Figure C4-6



We are studying the effects of migration on people in social studies. This is a survey pertaining to migration. We would appreciate it if you would fill this out with the correct information.

1. Was your last move
11 in town
6 in state
21 out of state
1 or other

2. When was your last move
14 1 year ago
13 2-3 years ago
6 4-5 years ago
5 longer than 5 years

3. Are you connected with
12 University
13 Industry
9 Professional Jobs
6 Others

4. Was your reason for moving
2 social reasons
28 job
3 climate

5. What was your family's first reaction when they learned about the move?
20 excited
4 upset
4 disappointed
7 willing
5 skeptical

6. Do you consider your move
10 temporary
10 undecided
19 permanent

7. Were your children (if in school) upset by having to leave their friends?
5 yes
26 no
6 indifferent
1 **not in school**

Figure C4-7

produce and distribute. They had hoped to sell it to all this year's fifth graders.

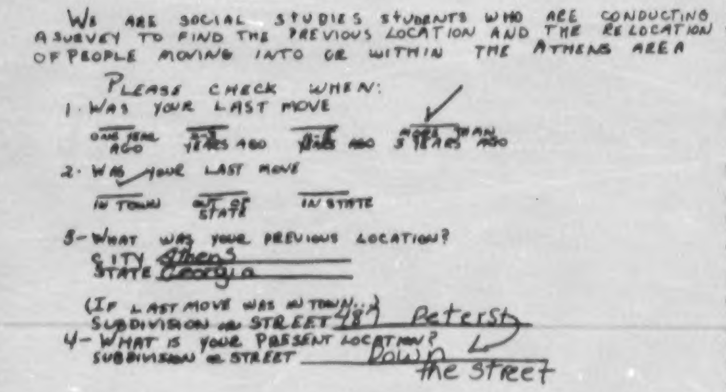
The students made a second draft of the pamphlet, including illustrations, to show to the principal for his approval. A copy of one of the pages of the booklet is shown in Figure C4-5. The principal was very pleased with their idea and said he'd been wanting such a booklet for some time. He made a few corrections to their proofs and suggested that the students visit each team in the school, as well as the library and the counselors. He also asked the students to find out how much the pamphlet would cost.

Encouraged by the principal's positive response, the students set out to interview other members of the school concerning the booklet. They also tried to decide how the booklet should be stapled together to be the most economical. This proved to be difficult as both sides of the paper had to be used, and the students could not decide whether it would be better to staple along a fold or to cut the pages and staple along one side. Sketches of their two choices are shown in Figure C4-6.

The pamphlet group decided that they would need 300 copies for the incoming students, but when they phoned several printers, they were quoted costs that were over $100. They then found out that if they could manage with fewer than one hundred copies, the cost would be about seven cents a copy for duplicating. The manufacturing of the booklet was held up because the student who had volunteered to type it found that she didn't have the time, and the group decided to ask the secretary to do it.

The second area to be studied was the effects of moving on the people themselves. Girls working on this problem designed a survey and distributed it to new students, asking how the family had reacted to moving and whether the children were upset by having to leave their friends. A copy of the survey with the results is shown in Figure C4-7. The results were tallied and displayed in bar graphs. They later wrote questionnaires to find where people came from and where people had moved to in Athens. This questionnaire, shown in Figure C4-8, was distributed to approximately fifty students in each of the grades at Hilsman.

The students collected the data from the questionnaire for all the people who had moved within the last five years and marked the location of their previous home with a dot on either a county map, a state map, or a United States map. By using information from the counselor's office, they did the same for students who had moved from Athens to out-of-state locations.



WE ARE SOCIAL STUDIES STUDENTS WHO ARE CONDUCTING A SURVEY TO FIND THE PREVIOUS LOCATION AND THE RELOCATION OF PEOPLE MOVING INTO OR WITHIN THE ATHENS AREA

PLEASE CHECK WHEN:

1. WAS YOUR LAST MOVE

ONE YEAR AGO — [illegible] YEARS AGO — [illegible] AGO — [✓ MORE THAN 5 YEARS AGO]

2. WAS YOUR LAST MOVE

IN TOWN — OUT OF STATE — IN STATE

3- WHAT WAS YOUR PREVIOUS LOCATION?

CITY Athens

STATE Georgia

(IF LAST MOVE WAS IN TOWN...)

SUBDIVISION OR STREET 487 Peters St

4- WHAT IS YOUR PRESENT LOCATION?

SUBDIVISION OR STREET Down the street

Figure C4-8

The students decided that the small maps were inadequate because the dots ran together. They decided to use a wall map instead. In order to draw this, they stuck white paper on the wall and projected a map of the United States on it with an opaque projector. They then traced the outline of the U.S. and those of the states. The students had to use the large atlas from the library in order to locate the towns correctly. They then found a large cardboard box (which had held a washing machine) and transferred the wall map to the cardboard. They had to do this so that they could stick pins into the map at the various locations. They then stretched yarn from these locations to Athens. They used green yarn to show moves to Athens and yellow yarn to show moves away from Athens to other parts of the country. The map stimulated a lot of interest from other students in the school and provoked comments, such as, "I used to live there," and, "why would someone from Los Angeles ever move to Athens?" Some students used atlases to check the location of the towns on the map. The children who had made the map were very proud of their work and often visited the room "to make sure it was staying up."*

At the end of the school year the school secretary had not yet had time to type the Hilsman Highlights handbook. However, she promised to type it during the vacation, and the two boys in charge of the project arranged to collect the booklet from her at the beginning of August. They planned to have it duplicated during August so that it would be ready to distribute to the new sixth graders at the beginning of the school year.

Three members of the Slide/Tape Show Group took their slide show to the three elementary schools. As they had not managed to tape the script yet, the students read the script as they projected the slides. The students also took the fifth graders on a tour of Hilsman Middle School to help orient them to the school when they arrived in September.

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*Students making a school directory might include a copy of such a map, coded so that the state of origin of individual students can be found. This might help students get to know one another, either because of a common background or because of an interest in a different part of the country.--ED.

D. References

1. LIST OF "HOW TO" CARDS

Below are listed the current "How To" Card titles that students working on the Orientation challenge might find useful. A complete listing of both the "How To" Cards and the Design Lab "How To" Cards is contained in the USMES Guide. In addition, the Design Lab Manual contains the list of Design Lab "How To" Cards.

GEOMETRY	G 1	How to Construct a Circle Which is a Certain Distance Around
GRAPHING	GR 1	How to Make a Bar Graph Picture of Your Data
	GR 2	How to Show the Differences in Many Measurements or Counts of the Same Thing by Making a Histogram
	GR 3	How to Make a Line Graph Picture of Your Data
	GR 4	How to Decide Whether to Make a Bar Graph Picture or a Line Graph Picture of Your Data
	GR 5	How to Find Out if There Is Any Relationship Between Two Things by Making a Scatter Graph
	GR 6	How to Make Predictions by Using a Scatter Graph
	GR 7	How to Show Several Sets of Data on One Graph
MEASUREMENT	M 1	How to Use a Stopwatch
	M 2	How to Measure Distances
	M 3	How to Measure Large Distances by Using a Trundle Wheel
	M 9	How to Make a Conversion Graph to Use in Changing Measurements from One Unit to Another Unit
	M 10	How to Use a Conversion Graph to Change *Any* Measurement in One Unit to Another Unit
PROBABILITY AND STATISTICS	PS 2	How to Record Data by Tallying
	PS 3	How to Describe Your Set of Data by Finding the Average
	PS 4	How to Describe Your Set of Data by Using the Middle Piece (Median)
	PS 5	How to Find the Median of a Set of Data from a Histogram
RATIOS, PROPORTIONS, AND SCALING	R 1	How to Compare Fractions or Ratios by Making a Triangle Diagram*
	R 2	How to Make a Drawing to Scale
	R 3	How to Make Scale Drawings Bigger or Smaller

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*Presently called Slope Diagram.

New titles to be added:

How to Round Off Data
How to Design and Analyze a Survey
How to Choose a Sample
How to Make and Use a Cumulative Distribution Graph
How to Map a Large Area

A cartoon-style series of "How To" Cards for primary grades is being developed from the present complete set. In most cases titles are different and contents have been rearranged among the various titles. It is planned that this additional series will be available early in 1977.

2. LIST OF BACKGROUND PAPERS

As students work on USMES challenges, teachers may need background information that is not readily accessible elsewhere. The Background Papers fulfill this need and often include descriptions of activities and investigations that students might carry out.

Below are listed titles of current Background Papers that teachers may find pertinent to Orientation. The papers are grouped in the categories shown, but in some cases the categories overlap. For example, some papers about graphing also deal with probability and statistics.

The Background Papers are being revised, reorganized, and rewritten. As a result, many of the titles will change.

GRAPHING	*GR 3 Using Graphs to Understand Data* by Earle Lomon *GR 4 Representing Several Sets of Data on One Graph* by Betty Beck *GR 6 Using Scatter Graphs to Spot Trends* by Earle Lomon *GR 7 Data Gathering and Generating Graphs at the Same Time (or Stack 'Em and Graph 'Em at One Fell Swoop!)* by Edward Liddle
GROUP DYNAMICS	*GD 2 A Voting Procedure Comparison That May Arise in USMES Activities* by Earle Lomon
MEASUREMENT	*M 3 Determining the Best Instrument to Use for a Certain Measurement* by USMES Staff
PROBABILITY AND STATISTICS	*PS 1 Collecting Data in Sets or Samples* by USMES Staff *PS 4 Design of Surveys and Samples* by Susan J. Devlin and Anne E. Freeny *PS 5 Examining One and Two Sets of Data Part I: A General Strategy and One-Sample Methods* by Lorraine Denby and James Landwehr
RATIOS, PROPORTIONS, AND SCALING	*R 1 Graphic Comparison of Fractions* by Merrill Goldberg *R 2 Geometric Comparison of Ratios* by Earle Lomon *R 3 Making and Using a Scale Drawing* by Earle Lomon

3. BIBLIOGRAPHY OF NON-USMES MATERIALS

The following materials are references that may be of some use during work on Orientation. The teacher is advised to check directly with the publisher regarding current prices. A list of references on general mathematics and science topics can be found in the *USMES Guide*.

Ring, Arthur., *Planning and Producing Handmade Slides and Filmstrips for the Classroom*. Lear Siegler, Inc./Fearon Publishers, 6 Davis Drive, Belmont, California 94002. 1974.

Explains and illustrates how simple handmade slides and filmstrips can be made in the classroom without the need for a camera, using inexpensive materials such as acetate film, thermofax transparency, overexposed and underexposed commercially mounted slides, and clear adhesive shelf paper. Also includes master worksheets for both slides and filmstrips with advice on making presentations.

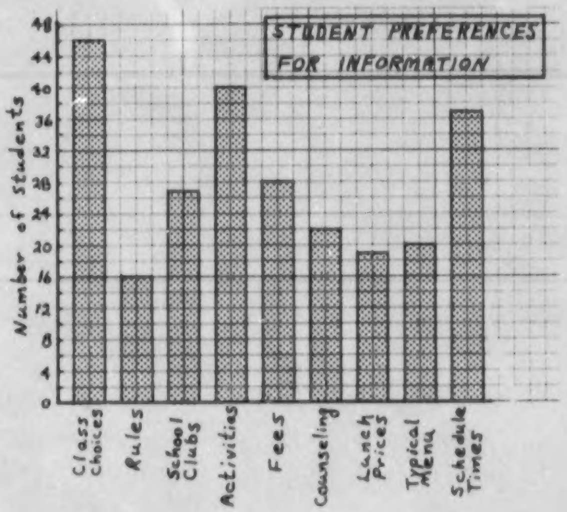
4. GLOSSARY

The following definitions may be helpful to a teacher whose class is investigating an Orientation challenge. These terms may be used when they are appropriate for the children's work. For example, a teacher may tell the children that when they conduct surveys, they are collecting *data*. It is not necessary for the teacher or students to learn the definitions nor to use all of these terms while working on their challenge. Rather, the children will begin to use the words and understand the meanings as they become involved in their investigations.

Audio	Relating to the transmission, reception, or reproduction of sound.
Audiovisual	Relating to both hearing and sight.
Average	The numerical value obtained by dividing the sum of the elements of a set of data by the number of elements in that set. Also called the mean.
Caption	An explanatory title that accompanies a drawing or photograph.
Conversion	A change from one form to another. Generally associated in mathematics and science with the change from one unit of measure to another or the change from one form of energy to another.
Correlation	A relationship between two sets of data.
Cost	The amount of money needed to produce or to purchase goods or services.
Data	Any facts, quantitative information, or statistics.
Discount	A reduction in the price of products or services, often stated as a percentage of price. This is done (1) for customers who buy in large quantities or (2) in order to generate a greater volume of sales.
Distribution	The spread of data over the range of possible results.

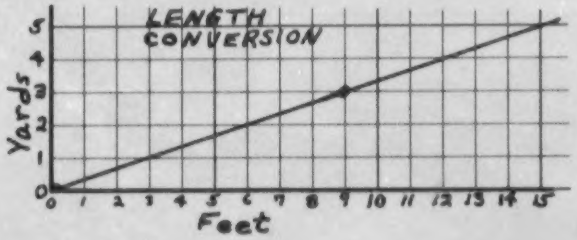
Edit	To collect and arrange materials into a finished publication or program.
Event	A happening; an occurrence; something that takes place. Example: when a child moves.
Frequency	The number of times a certain event occurs in a given unit of time or in a given total number of events.
Graph	A drawing or a picture of one or several sets of data.
Bar Graph	A graph of a set of measures or counts whose sizes are represented by the vertical (or horizontal) lengths of bars of equal widths. Example: survey results on the total number of students desiring information on various topics.

Information Desired	Number of Students
Class Choices	46
Rules	16
School Clubs	27
Activities	40
Fees	28
Counseling	22
Lunch Prices	19
Typical Menu	20
Schedule, Times	37



Conversion Graph	A line graph that is used to change one unit of measurement to another. Example: changing feet to yards.

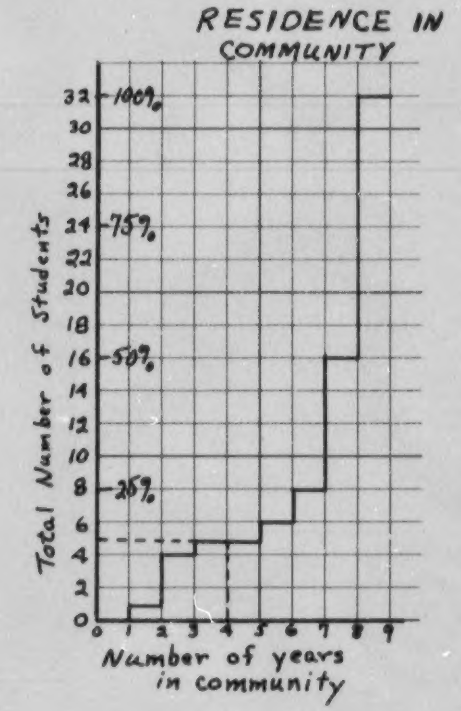
Feet	Yards
0	0
9	3



Cumulative Distribution Graph

A graph that can be constructed from a histogram by computing running totals from the histogram data. The first running total is the first value in the histogram data (see table of values). The second running total is the sum of the first and second values of the histogram, the third is the sum of first, second, and third values, and so on. The horizontal scale on the graph is similar to that of the histogram; the vertical scale goes from 0 to the total number of events observed or samples taken (in the example, the total number of students surveyed). Each vertical distance on the graph shows the running total of the number of samples taken that are less than or equal to the value shown on the horizontal scale; thus, the graph below indicates that five students (or about 16% of the total) had lived in the community for four or fewer years.

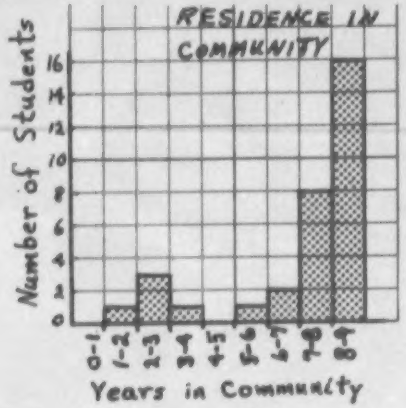
Number of Years in Community	Total Number of Students
1 or fewer	0
2 " "	1
3 " "	4
4 " "	5
5 " "	5
6 " "	6
7 " "	8
8 " "	16
9 " "	32



Histogram

A type of bar graph that shows the distribution of the number of times that different measures or counts of the same event have occurred. A histogram always shows ordered numerical data on the horizontal axis. Example: the number of students who have lived within a community for a given period of time.

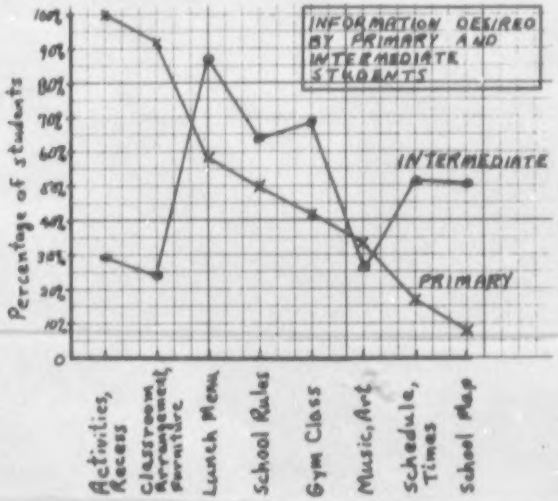
Years in Community	Number of Students
1	0
2	1
3	3
4	1
5	0
6	1
7	2
8	8
9	16



Line Chart

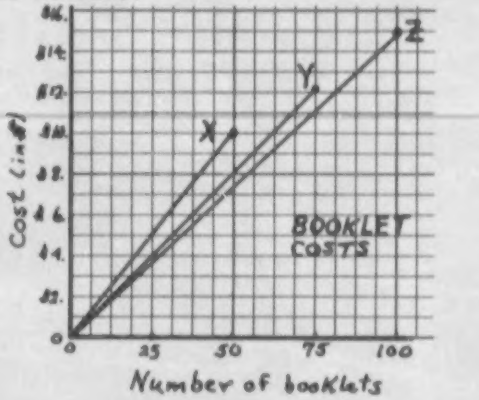
A bar graph that is represented by circles, triangles, or crosses with lines connecting them so that it has the appearance of a line graph. (See *Line Graph*.) This is a useful representation when two or more sets of data are shown on the same graph. Example: survey results on the percentages of primary students and of intermediate students desiring information on various topics.

Information Desired	Percentage of Students	
	Primary	Intermediate
Activities, Recess	100%	29%
Classroom Arrangement, Furniture	92%	24%
Lunch Menu	58%	87%
School Rules	50%	63%
Gym Class	42%	68%
Music, Art	33%	27%
Schedule, Times	17%	52%
School Map	8%	51%



Line Graph	A graph in which a smooth line or line segments pass through or near points representing members of a set of data. Since the line represents an infinity of points, the variable on the horizontal axis must be continuous. If the spaces between the markings on the horizontal axis have no meaning, then the graph is not a line graph, but a line chart (see *Line Chart*), even though the data points are connected by lines.
Slope Diagram	A graphical means of comparing fractions or ratios. To represent the ratio a/b, plot the point (b,a) and draw a line from (b,a) to the origin, (0,0). The slope of this line represents the ratio a/b. By comparing slopes of several lines, different ratios can be compared; the steeper the line, the larger the ratio. For example, in the diagram showing the ratio of price to number of booklets for different ways to produce the booklet, the ratio of price to number for method X is larger than that for methods Y and Z, and therefore method X costs the most per booklet, while method Z costs the least per booklet.

Printing Method	Number of Booklets	Cost
X	50	\$10.00
Y	75	\$12.50
Z	100	\$15.00



Histogram	See *Graph*.
Hypothesis	A tentative conclusion made in order to test its implications or consequences.
Inference	An assumption derived from facts or information considered to be valid and accurate.
Investment	The outlay of money for a future financial return.
Mean	See *Average*.

Median	The middle value of a set of data in which the elements have been ordered from smallest to largest. The median value has as many elements above it as below it.
Mode	The element or elements in a set of data that occur most often.
Ordered Set	A set of data arranged from smallest to largest.
Per Cent	Literally per hundred. A ratio in which the denominator is always 100, e.g., 72 per cent = 72/100 = 0.72 = 72% , where the symbol % represents 1/100.
Percentage	A part of a whole expressed in hundredths.
Probability	The likelihood or chance (expressed numerically) of one event occurring out of several possible events.
Proportion	A statement of equality of two ratios, i.e., the first term divided by the second term equals the third term divided by the fourth term, e.g., 5/10 = 1/2. Also a synonym for ratio: when two quantities are in direct proportion, their ratios are the same.
Quartile	
First	The first quartile is the value of the quarter-way piece of data in an ordered set of data.
Third	The third quartile is the value of the three-quarter-way piece of data in an ordered set of data.
Interquartile Range	The range or length of the middle 50% of an ordered set of data; the difference between the first and third quartile.
Range	Mathematical: the difference between the smallest and largest values in a set of data.
Rank	To order the members of a set according to some criterion, such as size or importance. Example: to put pieces of data from smallest to largest.
Ratio	The quotient of two denominate numbers or values indicating the relationship in quantity, size, or amount between two different things. For example, the ratio of the price for a certain number of booklets to the number of booklets might be $\frac{\$15}{100\text{ booklets}}$ or $15:100 booklets .

Retail Price	The price level of goods sold in small quantity to the consumer.
Sample	A representative fraction of a population studied to gain information about the whole population.
Sample Size	The number of elements in a sample.
Scale	A direct proportion between two sets of dimensions (as between the dimensions in a drawing of a lab and the actual lab).
Scale Drawing	A drawing whose dimensions are in direct proportion to the object drawn.
Scale Map	A map whose dimensions are in direct proportion to the dimensions of the area represented.
Statistics	The science of drawing conclusions or making predictions using a collection of quantitative data.
Tally	A visible record used to keep a count of some set of data, especially a record of the number of times one or more events occur. Example: the number of students desiring information on the lunch menu.
Wholesale Price	The price level of goods sold in large quantity to a merchant for resale.

E. Skills, Processes, and Areas of Study Utilized in **Orientation**

The unique aspect of USMES is the degree to which it provides experience in the process of solving real problems. Many would agree that this aspect of learning is so important as to deserve a regular place in the school program even if it means decreasing to some extent the time spent in other important areas. Fortunately, real problem solving is also an effective way of learning many of the skills, processes, and concepts in a wide range of school subjects.

On the following pages are five charts and an extensive, illustrative list of skills, processes, and areas of study that are utilized in USMES. The charts rate Orientation according to its potential for learning in various categories of each of five subject areas—real problem solving, mathematics, science, social science, and language arts. The rating system is based on the amount that each skill, process, or area of study within the subject areas is used—extensive (1), moderate (2), some (3), little or no use (-). (The USMES Guide contains a chart that rates all USMES units in a similar way.)

The chart for real problem solving presents the many aspects of the problem-solving process that students generally use while working on an USMES challenge. A number of the steps in the process are used many times and in different orders, and many of the steps can be performed concurrently by separate groups of students. Each aspect listed in the chart applies not only to the major problem stated in the unit challenge but also to many of the tasks each small group undertakes while working on a solution to the major problem. Consequently, USMES students gain extensive experience with the problem-solving process.

The charts for mathematics, science, social science, and language arts identify the specific skills, processes, and areas of study that may be learned by students as they respond to an Orientation challenge and become involved with certain activities. Because the students initiate the activities, it is impossible to state unequivocally which activities will take place. It is possible, however, to document activities that have taken place in USMES classes and identify those skills and processes that have been used by the students.

Knowing in advance which skills and processes are likely to be utilized in Orientation and knowing the extent that they will be used, teachers can postpone the teaching of those skills in the traditional manner until later in the year. If the students have not learned them during their USMES activities by that time, they can study them in the usual way. Further, the charts enable a teacher to integrate USMES more readily with other areas of classroom work. For example, teachers may teach fractions during math period when fractions are also being learned and utilized in the students' USMES activities. Teachers who have used USMES for several successive years have found that students are more motivated to learn basic skills when they have determined a need for them in their USMES activities. During an USMES session the teacher may allow the students to learn the skills entirely on their own or from other students, or the teacher may conduct a skill session as the need for a particular skill arises.

Because different USMES units have differing emphases on the various aspects of problem solving and varying amounts of possible work in the various subject areas, teachers each year might select several possible challenges, based on their students' previous work in USMES, for their class to consider. This choice should provide students with as extensive a range of problems and as wide a variety of skills, processes, and areas of study as possible during their years in school. The charts and lists on the following pages can also help teachers with this type of planning.

Some USMES teachers have used a chart similar to the one given here for real problem solving as a record-keeping tool, noting each child's exposure to the various aspects of the process. Such a chart might be kept current by succeeding teachers and passed on as part of a student's permanent record. Each year some attempt could be made to vary a student's learning not only by introducing different types of challenges but also by altering the specific activities in which each student takes part. For example, children who have done mostly construction work in one unit may be encouraged to take part in the data collection and data analysis in their next unit.

Following the rating charts are the lists of explicit examples of real problem solving and other subject area skills, processes, and areas of study learned and utilized in Orientation. Like the charts, these lists are based on documentation of activities that have taken place in USMES classes. The greater detail of the lists allows teachers to see exactly how the various basic skills, processes, and areas of study listed in the charts may arise in Orientation.

The number of examples in the real problem solving list have been limited because the list itself would be unreasonably long if all the examples were listed for some of the categories. It should also be noted that the example(s) in the first category--*Identifying and Defining Problems*--have been limited to the major problem that is the focus of the unit. During the course of their work, the students will encounter and solve many other, secondary problems, such as the problem of how to display their data or how to draw a scale layout.

Breaking down an interdisciplinary curriculum like USMES into its various subject area components is a difficult and highly inexact procedure. Within USMES the various subject areas overlap significantly, and any subdivision must be to some extent arbitrary. For example, where does measuring as a mathematical skill end and measurement as science and social science process begin? How does one distinguish between the processes of real problem solving, of science, and of social science? Even within one subject area, the problem still remains--what is the difference between graphing as a skill and graphing as an area of study? This problem has been partially solved by judicious choice of examples and extensive cross-referencing.

Because of this overlap of subject areas, there are clearly other outlines that are equally valid. The scheme presented here was developed with much care and thought by members of the USMES staff with help from others knowledgeable in the fields of mathematics, science, social science, and language arts. It represents one method of examining comprehensively the scope of USMES and in no way denies the existence of other methods.

REAL PROBLEM SOLVING	Overall Rating
Identifying and defining problem.	1
Deciding on information and investigations needed.	1
Determining what needs to be done first, setting priorities.	1
Deciding on best ways to obtain information needed.	1
Working cooperatively in groups on tasks.	1
Making decisions as needed.	1
Utilizing and appreciating basic skills and processes.	1
Carrying out data collection procedures--observing, surveying, researching, measuring, classifying, experimenting, constructing.	1
Asking questions, inferring.	1
Distinguishing fact from opinion, relevant from irrelevant data, reliable from unreliable sources.	1

REAL PROBLEM SOLVING	Overall Rating
Evaluating procedures used for data collection and analysis, Detecting flaws in process or errors in data.	1
Organizing and processing data or information.	1
Analyzing and interpreting data or information.	1
Predicting, formulating hypotheses, suggesting possible solutions based on data collected.	1
Evaluating proposed solutions in terms of practicality, social values, efficacy, aesthetic values.	1
Trying out various solutions and evaluating the results, testing hypotheses.	1
Communicating and displaying data or information.	2
Working to implement solution(s) chosen by the class.	1
Making generalizations that might hold true under similar circumstances; applying problem-solving process to other real problems.	1

KEY: 1 = extensive use, 2 = moderate use, 3 = some use, - = little or no use.

MATHEMATICS	Overall Rating
Basic Skills	
Classifying/Categorizing	3
Counting	1
Computation Using Operations	
Addition/Subtraction	2
Multiplication/Division	1
Fractions/Ratios/Percentages	2
Business and Consumer Mathematics/ Money and Finance	2
Measuring	1
Comparing	-
Estimating/Approximating/Rounding Off	1
Organizing Data	1
Statistical Analysis	3
Opinion Surveys/Sampling Techniques	2
Graphing	3
Spatial Visualization/Geometry	2
Areas of Study	
Numeration Systems	2
Number Systems and Properties	2
Denominate Numbers/Dimensions	1
Scaling	2
Symmetry/Similarity/Congruence	-
Accuracy/Measurement Error/ Estimation/Approximation	1
Statistics/Random Processes/Probability	3
Graphing/Functions	3
Fraction/Ratio	2
Maximum and Minimum Values	-
Equivalence/Inequality/Equations	-
Money/Finance	2
Set Theory	-

SCIENCE	Overall Rating
Processes	
Observing/Describing	1
Classifying	3
Identifying Variables	3
Defining Variables Operationally	3
Manipulating, Controlling Variables/ Experimenting	3
Designing and Constructing Measuring Devices and Equipment	3
Inferring/Predicting/Formulating, Testing Hypotheses/Modeling	1
Measuring/Collecting, Recording Data	1
Organizing, Processing Data	1
Analyzing, Interpreting Data	1
Communicating, Displaying Data	2
Generalizing/Applying Process to New Problems	1
Areas of Study	
Measurement	2
Motion	-
Force	-
Mechanical Work and Energy	-
Solids, Liquids, and Gases	-
Electricity	-
Heat	-
Light	-
Sound	-
Animal and Plant Classification	-
Ecology/Environment	-
Nutrition/Growth	-
Genetics/Heredity/Propagation	-
Animal and Plant Behavior	-
Anatomy/Physiology	-

KEY: 1 = extensive use, 2 = moderate use, 3 = some use, - = little or no use

SOCIAL SCIENCE	Overall Rating
Process	
Observing/Describing/Classifying	1
Identifying Problems, Variables	1
Manipulating, Controlling Variables/ Experimenting	3
Inferring/Predicting/Formulating, Testing Hypotheses	1
Collecting, Recording Data/Measuring	2
Organizing, Processing Data	2
Analyzing, Interpreting Data	2
Communicating, Displaying Data	2
Generalizing/Applying Process to Daily Life	1
Attitudes/Values	
Accepting responsibility for actions and results	1
Developing interest and involvement in human affairs	1
Recognizing the importance of individual and group contributions to society	1
Developing inquisitiveness, self-reliance, and initiative	1
Recognizing the values of cooperation, group work, and division of labor	1
Understanding modes of inquiry used in the sciences, appreciating their power and precision	1
Respecting the views, thoughts, and feelings of others	1
Being open to new ideas and information	1
Learning the importance and influence of values in decision making	1
Areas of Study	
Anthropology	3
Economics	-
Geography/Physical Environment	3
Political Science/Government Systems	2
Recent Local History	3
Social Psychology/Individual and Group Behavior	1
Sociology/Social Systems	1

LANGUAGE ARTS	Overall Rating
Basic Skills	
Reading	
Literal Comprehension: Decoding Words Sentences, Paragraphs	1
Critical Reading: Comprehending Meanings, Interpretation	1
Oral Language	
Speaking	1
Listening	1
Memorizing	-
Written Language	
Spelling	1
Grammar: Punctuation, Syntax, Usage	1
Composition	1
Study Skills	
Outlining/Organizing	1
Using References and Resources	1
Attitudes/Values	
Appreciating the value of expressing ideas through speaking and writing	1
Appreciating the value of written resources	1
Developing an interest in reading and writing	1
Making judgments concerning what is read	1
Appreciating the value of different forms of writing, different forms of communication	1

KEY: 1 = extensive use, 2 = moderate use,
3 = some use, - = little or no use

REAL PROBLEM SOLVING IN ORIENTATION

Identifying and Defining Problems	• Students decide to help new students and school visitors by informing them about the school and its program. • See also SOCIAL SCIENCE list: *Identifying Problems, Variables*.
Deciding on Information and Investigations Needed	• After a discussion students decide they need to survey students to find out which things they want information on. • Students decide that a slide/tape show will inform many people (students and parents) about the school. • Students decide that information on students is needed for a school handbook.
Determining What Needs to be Done First, Setting Priorities	• Children decide to conduct opinion survey first so that they will know where to concentrate their efforts. • Children decide to take photographs and select the best ones before beginning a script for the slide/tape show.
Deciding on Best Ways to Obtain Information Needed	• Students conduct opinion survey to obtain student preferences for information. • Students decide to interview principal to obtain information on school and its program.
Working Cooperatively in Groups on Tasks	• Students form groups to conduct survey, to take photographs, to prepare script, to prepare writeups on school program, to draw scale map of school.
Making Decisions as Needed	• Students decide to work in groups so that more can be accomplished. • Students decide to survey a sample of students from each grade. • Students decide to present a slide/tape show as part of their orientation program. • Students decide that a school handbook is needed.
Utilizing and Appreciating Basic Skills and Processes	• Students measure classrooms, hallways, and other parts of the school for scale map. • Students time sections of slide/tape show.

Utilizing and Appreciating Basic Skills and Processes (cont.)	• Students interpret results of survey to find topics of greatest concern to students. • Students give oral presentation (orientation program). • See also MATHEMATICS, SCIENCE, SOCIAL SCIENCE, and LANGUAGE ARTS lists.
Carrying Out Data Collection Procedures--Opinion Surveying, Researching, Measuring, Classifying, Experimenting, Constructing	• Students conduct opinion survey. • Students look up school regulations. • Students measure building for scale map. • Students classify people to be reached by orientation program. • Students make directional signs, trundle wheel. • See also MATHEMATICS list: *Classifying/Categorizing; Measuring; Opinion Surveys/Sampling Techniques.* • See also SCIENCE list: *Observing/Describing; Classifying; Manipulating, Controlling Variables/Experimenting; Designing and Constructing Measuring Devices and Equipment; Measuring/Collecting, Recording Data.* • See also SOCIAL SCIENCE list: *Observing/Describing/ Classifying; Manipulating, Controlling Variables/ Experimenting; Collecting, Recording Data/Measuring.*
Asking Questions, Inferring	• Students ask whether new students have orientation problems and infer from interviews and surveys that they do. • Students infer that the results from a sample of students reflect the views of all the students. • Students infer from the response to their orientation program that it helped. • See also SCIENCE list: *Inferring/Predicting/Formulating, Testing Hypotheses/Modeling.* • See also SOCIAL SCIENCE list: *Inferring/Predicting/ Formulating, Testing Hypotheses.*
Distinguishing Fact from Opinion, Relevant from Irrelevant Data, Reliable from Unreliable Sources	• Students recognize the qualitative aspects of obtaining data from an opinion survey. • Students recognize that the principal is a reliable source of information about the school program.
Evaluating Procedures Used for Data Collection and Analysis, Detecting Flaws in Process or Errors in Data	• Students discuss methods used to measure for scale map of school and discuss any discrepancies. Students choose one method for final measurements.

Evaluating Procedures Used for Data Collection and Analysis, Detecting Flaws in Process or Errors in Data (cont.)	• Students decide to improve their opinion survey and discuss changes to be made. • See also MATHEMATICS list: *Estimating/Approximating/Rounding Off.*
Organizing and Processing Data	• Ordering results of opinion survey. • Tabulating times of various portions of slide/tape show. • See MATHEMATICS list: *Organizing Data* • See also SCIENCE and SOCIAL SCIENCE lists: *Organizing, Processing Data.*
Analyzing and Interpreting Data	• Interpreting results of opinion survey; drawing bar graph of results. • Determining whether slide/tape show needs to be shortened. • See also MATHEMATICS list: *Comparing; Statistical Analysis; Opinion Surveys/Sampling Techniques.* • See also SCIENCE and SOCIAL SCIENCE lists: *Analyzing, Interpreting Data.*
Predicting, Formulating Hypotheses, Suggesting Possible Solutions Based on Data Collected	• After conducting survey, students recommend several items to be covered in their orientation program. • Students hypothesize that a slide/tape show will inform a large number of people effectively. • Students hypothesize that a student handbook is needed and decide to produce one. • See also SCIENCE list: *Inferring/Predicting/Formulating, Testing Hypotheses/Modeling.* • See also SOCIAL SCIENCE: *Inferring/Predicting/Formulating, Testing Hypotheses.*
Trying Out Various Solutions and Evaluating the Results, Testing Hypotheses	• Students decide from the response to their orientation program that the slide/tape show was very effective in informing a large number of people. • Based on the demand for their student handbook, students decide that it was needed. • See also SCIENCE list: *Inferring/Predicting/Formulating, Testing Hypotheses/Modeling.* • See also SOCIAL SCIENCE list: *Inferring/Predicting/Formulating, Testing Hypotheses.*

Communicating and Displaying Data or Information	• Students draw scale map of school. • Students prepare and present slide/tape show. • See also MATHEMATICS list: *Graphing; Scaling.* • See also SCIENCE and SOCIAL SCIENCE lists: *Communicating, Displaying Data.* • See also LANGUAGE ARTS list.
Working to Implement Solution(s) Chosen by the Class	• Students prepare and present orientation program. • Students prepare student handbook.
Making Generalizations That Might Hold True under Similar Circumstances; Applying Problem Solving Process to Other Real Problems	• Students apply knowledge and skills acquired to other new situations they encounter; students develop self-confidence about dealing with new situations. • See also SCIENCE list: *Generalizing/Applying Process to New Problems.* • See also SOCIAL SCIENCE list: *Generalizing/Applying Process to Daily Life.*

ACTIVITIES IN ORIENTATION UTILIZING MATHEMATICS

Basic Skills

Classifying/Categorizing	• Using the concepts of sets (subsets, unions, intersections, set notation), e.g., set of students, teachers, parents. • Organizing and classifying sets of materials, information, or activities, e.g., colors of paper for booklet, types of information for handbook. • See also SCIENCE list: *Classifying.* • See also SOCIAL SCIENCE list: *Observing/Describing/ Classifying.*
Counting	• Counting votes to set priorities and determine action to be taken. • Counting survey data, such as questionnaire data on problems faced by new students. • Counting number of meters, number of people. • Counting to read scales on measuring instruments, such as tape measures or yardsticks. • Counting by sets to find scale for graph axes.
Computation Using Operations: Addition/Subtraction	• Adding one-, two-, or three-digit whole numbers to find total tally or total measurement, such as size of the playing field for a scale drawing. • Adding minutes and seconds, e.g., when coordinating the timing of the slide/tape show. • Subtracting to find differences between predicted and actual measurement, e.g., the number of people attending an orientation program. • Subtracting one-, two-, or three-digit whole numbers to find ranges for graph axes or for measurement data.
Computation Using Operations: Multiplication/Division	• Using multiplication and division to increase or decrease measurements, e.g., for scale drawings. • Multiplying whole numbers to find total measurement, e.g., total cost of printing booklets. • Multiplying or dividing to find scale for graph axes. • Multiplying and dividing to convert units of measure, as from feet to inches, from inches to feet, from meters to centimeters. • Dividing to find unit measure, unit cost, e.g., for slide and booklet production.

Computation Using Operations: Multiplication/Division (cont.)	• Dividing to calculate averages, e.g., average number of students in a class. • Dividing to calculate ratios, fractions, or percentages while tabulating data, e.g., percentage of new students in school.
Computation Using Operations: Fractions/Ratios/Percentages	• Using mixed numbers to perform calculations, such as when measuring for a scale map of the school. • Changing fractions to higher or lower terms (equivalent fractions) to perform operations, such as adding measurements or computing dimensions on scale drawing. • Using ratios and fractions to convert from yards to inches, meters to centimeters. • Using ratios to increase or decrease measurements, e.g., for scale drawings of school rooms or school building. • Using fractions in measurement, graphing, graphic comparisons, scale drawings. • Calculating ratios or percentages from survey data. • Calculating actual measurements from scale drawings using ratio of scale drawing. • Calculating percentages of yes answers to compare questionnaire data from different grades. • Calculating percentage of students that should receive handbook.
Computation Using Operations: Business and Consumer Mathematics/ Money and Finance	• Adding, subtracting, multiplying, and dividing dollars and cents to perform cost analysis, e.g., on development and reproduction of slides, to figure cost and profit or loss on student handbooks. • Using comparative shopping for materials and services, e.g., paper, printing, film, film developing. • Assessing cost of items for orientation program (such as slides) vs. effectiveness of item. • Gaining experience with finance: sources, uses, and limitations of revenues.
Measuring	• Using arbitrary units (e.g., children's feet) to measure the classroom. • Using different standard units of measure, e.g., to measure the auditorium. • Using different measuring tools. • Reading measuring devices, such as a meter stick or trundle wheel, accurately.

Measuring (cont.)	• Converting from one unit of measurement to another, e.g., inches to feet, meters to centimeters. • See also SCIENCE list: *Measuring/Collecting, Recording Data*. • See also SOCIAL SCIENCE list: *Collecting, Recording Data/Measuring*.
Comparing	• Using the concept of greater than and less than in making comparisons, e.g., comparing the number of new students in primary and intermediate grades. • Comparing quantitative data gathered from various sources, such as measurement data with that from blueprints of the school. • Comparing qualitative information gathered from various sources, such as survey data on problems gathered for new students and school visitors. • Comparing estimated and actual results, e.g., measurements of a given area of the school building. • Making graphic comparisons of fractions and ratios when determining the scale for a scale drawing. • See also SCIENCE and SOCIAL SCIENCE lists: *Analyzing, Interpreting Data*.
Estimating/Approximating/ Rounding Off	• Estimating error in qualitative judgments when collecting opinion survey data. • Estimating the number of people who will attend a meeting. • Estimating the size of a booklet or measurement of the lunchroom. • Determining when a measurement is likely to be accurate enough for a particular purpose. • Rounding off measurements while measuring portions of the school for a scale map. • Rounding off data when drawing a scale map of the school.
Organizing Data	• Tallying votes to set priorities. • Tallying survey data. • Tallying on bar graphs, histograms, such as number of students in each class that are new to the school. • Ordering real numbers on number line or graph axis. • Ordering test or survey results, such as student preferences for contents of booklet.

Organizing Data (cont.)	• Ordering centimeters and meters when making a scale drawing of the school. • See also SCIENCE and SOCIAL SCIENCE lists: *Organizing, Processing Data.*
Statistical Analysis	• Assessing predictability of larger sample based on results from smaller sample. • Finding average ratings for a survey that contains a rating scale. • Finding and comparing medians and modes of measurement data, e.g., median length of time a student has lived in the community. • Determining range of a set of data. • Compiling quantitative data--survey results, measurements, etc. • Interpreting bar graphs, histograms. • See also SCIENCE and SOCIAL SCIENCE lists: *Analyzing, Interpreting Data.*
Opinion Surveys/Sampling Techniques	• Conducting surveys; defining data collection methods, makeup and size of sample. • Devising methods of obtaining quantitative information about subjective opinions on problems of new students or school visitors. • See also SCIENCE and SOCIAL SCIENCE lists: *Analyzing, Interpreting Data.*

Graphing	• Using alternative methods of displaying survey data.
	• Making a graph form--dividing axes into parts, deciding on an appropriate scale.
	• Representing data on graphs:
	  • Bar graph--number of students desiring information on various topics.
	  • Cumulative distribution graph--number of students who have lived in the community for certain lengths of time or less.
	  • Conversion graph--to convert from feet to yards or centimeters to meters for mapping the school.
	  • Histogram--the number of students who have lived in the community for a given period of time.

Graphing (cont.)	• Line chart--percentage of students in each class or grade wanting information on various topics. • Slope diagram--ratio of price to number of orientation booklets produced by different methods. • Obtaining information from graphs. • See also SCIENCE and SOCIAL SCIENCE lists: *Communicating, Displaying Data.*
Spatial Visualization/Geometry	• Constructing and using geometric figures, for example, triangles, circles, etc., for name tags or signs. • Using geometric figures to understand and utilize relationships, such as area, similarity, congruence, etc. • Measuring and constructing using rulers, compasses, and protractors. • Using spatial arrangements to convey information, for example, scale drawings or maps. • Using the concept of *greater than* and *less than* to compare geometric figures.
Areas of Study	
Numeration Systems	• Using decimal system in measuring for scale map of school (metric system). • Using decimal system in calculations involving money in cost analysis. • Using fractions in measuring when using American system (inches, feet). • See also *Computation Using Operations: Fractions/ Ratios/Percentages.*
Number Systems and Properties	• See *Computation Using Operations.*
Denominate Numbers/Dimensions	• See *Measuring.*
Scaling	• Finding an appropriate scale (proportion) for a scale drawing. • Using a scale to draw and make representations in a scale drawing. • Deriving information from scale drawings, maps. • Making maps of nearby areas. • Learning to use compass direction for making maps.

Symmetry/Similarity/Congruence	• See *Spatial Visualization/Geometry.*
Accuracy/Measurement Error/ Estimation/Approximation	• See *Measuring* and *Estimating/Approximating/Rounding Off.*
Statistics/Random Processes/ Probability	• See *Statistical Analysis*
Graphing/Functions	• See *Graphing.*
Fraction/Ratio	• See *Computation Using Operations: Fractions/Ratios/ Percentages.*
Maximum and Minimum Values	• Finding the minimum cost to produce a student handbook, an informational booklet, a newsletter, etc.
Equivalence/Inequality/Equations	• See *Comparing* and *Computation Using Operations.*
Money/Finance	• See *Computation Using Operations: Business and Consumer Mathematics/Money and Finance.*
Set Theory	• See *Classifying/Categorizing.*

ACTIVITIES IN ORIENTATION UTILIZING SCIENCE

Process	
Observing/Describing	• Observing and describing areas to be photographed for slide/tape show. • Observing and describing physical layout of school building and grounds. • See also SOCIAL SCIENCE list: *Observing/Describing/Classifying*.
Classifying	• Classifying different orientation aids, such as booklets, slide/tape shows, tours, direction signs. • Classifying direction signs according to proposed size, shape, and color. • See also MATHEMATICS list: *Classifying/Categorizing*. • See also SOCIAL SCIENCE list: *Observing/Describing/Classifying*.
Identifying Variables	• Identifying width and length of rooms, hallways, lunchroom, gymnasium, etc., as things to be measured when making a scale drawing of the school layout. • Identifying cost as one thing to consider when making booklets, when devising an orientation program (cost of slides, photographs, etc.). • Identifying the number of students (people) to be reached by the orientation program as a variable to be considered. • Identifying length of slide/tape show as a variable to be measured and controlled. • See also SOCIAL SCIENCE list: *Identifying Problems, Variables*.
Defining Variables Operationally	• Defining length and width of halls, rooms, etc., as those measurements obtained by measuring with a meter stick (OR trundle wheel OR tape measure). • Defining measurements of the school as those taken from architectural blueprints. • Defining length of slide/tape show as the time from start to finish as measured by a stopwatch.

Manipulating, Controlling Variables/ Experimenting	• Measuring length of slide/tape show (or orientation program) with a stopwatch; editing portions to shorten program. • Determining cost of producing booklets for various types of paper, various numbers of copies, various printing methods. • See also SOCIAL SCIENCE list: *Manipulating, Controlling Variables/Experimenting*.
Designing and Constructing Measuring Devices and Equipment	• Constructing signs to direct people new to the school to various areas (office, gym, lunchroom, etc.). • Constructing trundle wheel to measure school buildings and grounds.
Inferring/Predicting/Formulating, Testing Hypotheses/Modeling	• Hypothesizing that an architectural blueprint will be sufficient for making a scale drawing of the school; measuring to find whether is so. • Hypothesizing that measurements taken with a trundle wheel will be accurate enough for a scale drawing of the school; drawing map and finding that they are. • Hypothesizing that a certain number of slides will be required for a certain length slide/tape show. • See also SOCIAL SCIENCE list: *Inferring/Predicting/ Formulating Testing Hypotheses*.
Measuring/Collecting, Recording Data	• Timing, e.g., the spoken portion of a slide/tape show to coordinate pictures with descriptions, using a stopwatch. • Taking photographs of various areas of the school. • Obtaining costs of making booklets by several different printing processes (e.g., offset, ditto). • See also MATHEMATICS list: *Measuring*. • See also SOCIAL SCIENCE list: *Collecting, Recording Data/Measuring*.
Organizing, Processing Data	• Tabulating measurements of school building and grounds before drawing a scale layout • Tabulating times of various portions of an orientation program. • See also MATHEMATICS list: *Organizing Data*. • See also SOCIAL SCIENCE list: *Organizing, Processing Data*.

Analyzing, Interpreting Data	• Interpreting graphs to determine cheapest method of reproducing booklets. • Determining that a certain number of slides has to be omitted from slide/tape show. • See also MATHEMATICS list: *Comparing; Statistical Analysis; Opinion Surveys/Sampling Techniques; Graphing.* • See also SOCIAL SCIENCE list: *Analyzing, Interpreting Data.*
Communicating, Displaying Data	• Drawing graphs or maps to communicate data. • See also MATHEMATICS list: *Graphing.* • See also SOCIAL SCIENCE list: *Communicating, Displaying Data.* • See also LANGUAGE ARTS list.
Generalizing/Applying Process to New Problems	• Using knowledge acquired to solve other problems, such as getting from place to place more easily in the school or community. • See also SOCIAL SCIENCE list: *Generalizing/Applying Process to Daily Life.*

Areas of Study

Measuring	• Timing the portions of an orientation program using a stopwatch; timing portions of a slide/tape show. • Observing the difference between minutes and seconds. • Measuring the school building and grounds with trundle wheels, meter stick, tape measures, etc. • See also *Measuring/Collecting, Recording Data.* • See also MATHEMATICS list: *Measuring.*
Motion	
Speed/Velocity	• Observing that electrically-run machines (saber saws, duplicating machines) are faster than hand machines.
Force	• Observing that electrically-run machines require less effort to operate than hand machines and multiply the force they exert.

Force (cont.)	• Observing that force must be applied to hammer nails into wood; observing that a hammer multiplies the force that can be exerted. • Observing that force must be exerted to operate a stapler.
Mechanical Work and Energy	• Noting that work is done and energy expended when nails are hammered into wood, when Tri-Wall is cut. • Observing that electrical energy is transformed into the mechanical energy of saber saws, electric drills. • See also *Motion* and *Force*.
Solids, Liquids, and Gases	
States of Matter	• Observing that glue is available in liquid or solid form, each having different properties. • Observing that a solid stick of glue is turned into a hot, liquid glue by using heat from a hot glue gun.
Properties of Matter	• Observing that different construction materials, such as lumber and Tri-Wall, have different properties that make them useful for different tasks. • Observing that various materials available have different densities and colors, e.g., papers for making student handbooks or directories.
Electricity	• Observing that electrical energy can be transformed into mechanical energy (electrical tools) and into heat energy (hot glue gun).
Light	• Observing that signs and posters are more easily read in well-lighted areas because objects become visible as light is reflected from them into the eye. • Observing that signs, posters, and other written messages may be difficult to read if both the writing and background are similar in color but may be more easily read if the colors are contrasting. • Observing that paints, crayons, papers came in various colors because different objects reflect certain colors in the spectrum and absorb the rest--the color of an object is determined by the color it reflects.

Light (cont.)	• Observing that too little light on an area results in underexposed (too dark) film and that too much light results in overexposed (too light) film when taking photographs for an orientation program.
Sound	• Observing that some of the electrical energy supplied to power tools is transformed into sound energy (noise). • Observing that the volume of the tape recorder (or of the students' voices) must be raised or lowered depending on the size of the group being addressed or the size of the room being used; observing that more energy is required to produce a louder sound. Sound is propagated in all directions and decreases as the distance from the source increases.

ACTIVITIES IN ORIENTATION UTILIZING SOCIAL SCIENCE

Process	
Observing/Describing/Classifying	• Observing and describing problems or difficulties faced by persons new to the school or community. • Classifying people to be reached by orientation program—new students, parents, new teachers, aides, visitors, etc. • Classifying characteristics of new students. • Classifying problems of new students and approaches to solving those problems. • See also MATHEMATICS list: *Classifying/Categorizing.* • See also SCIENCE list: *Observing/Describing; Classifying.*
Identifying Problems, Variables	• Identifying problems of new students, parents, school visitors, new teachers. • Identifying problems of persons unfamiliar with the community. • Identifying variables that affect the results of an opinion survey, such as age, grade level, habits of people, background of people. • See also SCIENCE list: *Identifying Variables.*
Manipulating, Controlling Variables/Experimenting	• Conducting trial runs of directional signs or uses of maps. • Designing and conducting an opinion survey on problems of students and keeping results for different groups separate. • See also SCIENCE list: *Manipulating, Controlling Variables/Experimenting.*
Inferring/Predicting/Formulating, Testing Hypotheses	• Inferring that the results from a sample of students reflect the concerns of all the students. • Predicting that a slide/tape show will be an effective way to orient people to the school. • Hypothesizing that an orientation program will help new students and their parents; conducting survey to determine whether this is so. • See also SCIENCE list: *Inferring/Predicting/Formulating, Testing Hypotheses/Modeling.*

Collecting, Recording Data/Measuring	• Recording results of opinion surveys on areas about which students want more information, problems of new students. • Counting number of students reached by orientation program. • See also MATHEMATICS list: *Counting; Measuring.* • See also SCIENCE list: *Measuring/Collecting, Recording Data.*
Organizing, Processing Data	• Ordering results of opinion surveys on problems of students from largest number to smallest. • See also MATHEMATICS list: *Organizing Data.* • See also SCIENCE list: *Organizing, Processing Data.*
Analyzing, Interpreting Data	• Interpreting results, including graphs, of survey data to find topics of greatest concern to students. • Comparing data from different groups in opinion survey. • Evaluating the way the opinion survey was administered, the size and makeup of the sample. • See also MATHEMATICS list: *Comparing, Statistical Analysis; Opinion Surveys/Sampling Techniques; Graphing.* • See also SCIENCE list: *Analyzing, Interpreting Data.*
Communicating, Displaying Data	• Making charts or maps that can be easily understood by new students, new teachers, parents, school visitors, etc. • Representing survey data on bar graphs. • See also MATHEMATICS list: *Graphing.* • See also SCIENCE list: *Communicating, Displaying Data.* • See also LANGUAGE ARTS list.
Generalizing/Applying Process to Daily Life	• Applying knowledge acquired to solve similar problems encountered in new situations. • See also SCIENCE list: *Generalizing/Applying Process to New Problems.*

Attitudes/Values

Accepting Responsibility for Actions and Results	• Making sure that various tasks (e.g., taking photos, conducting survey, obtaining necessary permissions, taking measurements, drawing maps, organizing program) are done.

Accepting Responsibility for Actions and Results (cont.)	• Arranging schedules for conducting survey. • Arranging schedule for orientation program. • Being responsible for actions while out of the classroom.
Developing Interest and Involvement in Human Affairs	• Informing visitors and newcomers to the school of the locations of various rooms. • Informing newcomers about the local community.
Recognizing the Importance of Individual and Group Contributions to Society	• Recognizing that their efforts will help all newcomers and visitors to the school.
Developing Inquisitiveness, Self-Reliance, and Initiative	• Conducting small and large group sessions with help from the teachers. • Dealing with various merchants to obtain supplies, printing of booklets. • Dealing with parents or secretaries to get things typed. • Finding own solutions to problems encountered. • Developing different ways to convey information, e.g., slide/tape show, question-and-answer session, tours, booklets.
Recognizing the Values of Cooperation, Group Work, and Division of Labor	• Finding that work on an orientation program progresses more rapidly when different groups work on different aspects of the program. • Finding that work progresses more smoothly when everyone cooperates.
Understanding Modes of Inquiry Used in the Sciences, Appreciating Their Power and Precision	• Identifying important problems of persons new to the school that the class can work to improve. • Recognizing the importance of obtaining information from the group of persons affected (persons new to the school, community). • Convincing the principal that the program they are proposing is useful through the use of supporting survey data. • See also MATHEMATICS and SCIENCE lists.
Respecting the Views, Thoughts, and Feelings of Others	• Considering all suggestions from members of group and assessing their merit.

Respecting the Views, Thoughts, and Feelings of Others (cont.)	• Conducting opinion survey to determine what information others may want. • Recognizing that people's opinions vary.
Being Open to New Ideas and Information	• Considering other ways of doing various tasks. • Asking other members of the class (other teachers, other students) for ideas and suggestions.
Learning the Importance and Influence of Values in Decision Making	• Recognizing that persons unfamiliar with the school or community may have differing needs for specific information and that different solutions may be required for different groups. • Recognizing that different people have different opinions on what they would like to see in a student handbook.

Areas of Study

Anthropology	• Observing and describing physical and language characteristics related to cultural and geographic background.
Geography/Physical Environment	• Investigating differences in problems due to differences in regional geography. • Making and using maps of school and school neighborhood.
Political Science/Government Systems	• Investigating systems of administration and control, e.g., working with school authorities to prepare and schedule orientation programs. • Investigating school rules when preparing orientation aids (program, booklet, etc.).
Recent Local History	• Investigating previous attempts at orientation aids in the school. • Including items of recent local history in any orientation program.
Social Psychology/Individual and Group Behavior	• Assessing the effects of group action on orienting newcomers to the school. • Recognizing and using different ways of helping different groups (new students, parents, school visitors, new teachers, teacher's aides, etc.).

Social Psychology/Individual and Group Behavior (cont.)	• Recognizing need for leadership within small and large groups; recognizing differing capacities of individuals for various roles within groups. • Analyzing the effects of a small group making decisions for a larger group.
Sociology/Social Systems	• Considering the integral, related nature of a community and its physical and recreational surroundings as a factor in orienting newcomers as well as others. • Devising a system of working cooperatively in small and large groups. • Investigating problems and making changes that affect other students and people in the community. • Working within established social systems to promote orientation program. • Recognizing peer groups as social systems. • Experiencing and understanding differences in social systems in different social groups (children, adults, women, men, etc.). • Recognizing that there are many different social groups and that one person belongs to more than one social group.

ACTIVITIES IN ORIENTATION UTILIZING LANGUAGE ARTS

Basic Skills

Reading: Literal Comprehension--Decoding Words, Sentences, and Paragraphs	• Decoding words, sentences, and paragraphs while reading school regulations, drafts of notes and surveys, script of slide/tape show, posters.
Reading: Critical Reading--Comprehending Meanings, Interpretation	• Reading and evaluating drafts of notes, surveys, scripts, posters. • Understanding and interpreting school regulations.
Oral Language: Speaking	• Reporting to class on group activities; responding to criticisms of activities. • Offering ideas, suggestions, and criticisms during discussions in small group work and during class discussions on problems and proposed solutions. • Preparing and giving effective oral presentations during orientation program. • Preparing and recording narrative for slide/tape show portion of orientation program. • Using the telephone properly and effectively. • Using rules of grammar in speaking. • Investigating effects of different forms of communication on people.
Oral Language: Listening	• Conducting interviews of teachers, new students. • Listening to group reports.
Written Language: Spelling	• Using correct spelling in writing.
Written Language: Grammar--Punctuation, Syntax, Usage	• Using rules of grammar in writing.
Written Language: Composition	• Writing to communicate effectively: • preparing notes and letters to parents and students. • writing opinion survey, devising questions to elicit desired information; judging whether a question is clear.

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Written Language: Composition (cont.)	• preparing writeups on new students or teachers, school rules, school program. • preparing orientation booklet. • preparing draft of script for slide/tape show.
Study Skills: Outlining/Organizing	• Taking notes. • Developing opinion survey; ordering questions. • Planning, preparing, and scheduling orientation program. • Organizing facts and data for inclusion in orientation program.
Study Skills: Using References and Resources	• Researching school regulations. • Referring to architectural blueprints of school building. • Using library and references to obtain information on taking photographs, preparing/slide/tape show.

Attitudes/Values

Appreciating the Value of Expressing Ideas Through Speaking and Writing	• Finding that a written letter or note evokes a response from people--other students, parents, the principal, other teachers. • Finding that many students and parents can be informed about the school through an orientation program. • Finding that many students can be helped by a school handbook.
Appreciating the Value of Written Resources	• Finding that certain desired information can be found in written resources, e.g., lists of new students, school regulations, addresses and telephone numbers of students and teachers, descriptions of local community and its resources (as from chambers of commerce or park and recreation departments). • Finding that a written narrative for the slide/tape show is essential so that important ideas are not omitted.
Developing an Interest in Reading and Writing	• Willingly looking up required information on new students, on school program, on school building, on local community. • Showing desire to work on writeups, letters, reports, scripts for slide/tape show, newsletter.

Making Judgments Concerning What is Read	• Deciding how reliable the information is. • Deciding whether drafts of letters, notes, scripts, newsletter say what they are supposed to say, whether they are appropriate, whether they are clear, whether they need improvement.
Appreciating the Value of Different Forms of Writing, Different Forms of Communication	• Finding that how information can be best conveyed is determined in part by the audience to whom it is directed. • Finding that certain information or data can be best conveyed in writing, preparing charts or graphs, using slide/tape show, drawing maps, etc. • Finding that certain information should be written down so that it can be referred to at a later time. • Finding that spoken instructions are sometimes better than written instructions, and vice versa.